INTELLECTUAL CAPITAL AND ORGANIZATIONAL PERFORMANCE: THE MEDIATING ROLE OF PERFORMANCE MEASUREMENT SYSTEM

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ABSTRACT

Globally, information-age economy has superseded the industrial and retail economy. That is, the economy has shifted from an industrial economy, primarily based on physical capital, to an economy based on intellectual capital (henceforth referred to as IC). The effective use of IC factors mainly includes knowledge, relationships, and intellectual property is considered as a cornerstone for the value creation in today's hyper-competitive environment. The central concern which motivates the current study is stemming from the intangible nature of the IC. There is a limited insight on how different types of intangible resources are managed by the firm in a way that such competitive advantage is gained and sustained. However, despite the unobservable nature of IC, the organizations possess other more readily observable feature, which is labeled as organizational control system in general and performance measurement system in particular, that can be used to illuminate the properties and use of its knowledge; Regardless of how control systems are defined, they have a critical feature that has overlooked in the literature: their ability to manage the flow of knowledge and IC inside the organizations.

A survey questionnaire was used to collect data for this research. The structural equation modeling (PLS) was employed to examine the associations hypothesized. This study suggests findings according to a sample of Iranian public listed companies which indicated that there is a significant association between the extent of investment in IC and organizational performance overall. Besides, IC level is strongly related to the extent use of certain performance measurement usage either in terms of diversity of measurement or the balanced use of interactive and diagnostic PMS. More importantly, the findings revealed that the emphasis lay upon the use of certain PMS matters given the fact that they mediate the association between the IC and organizational performance. As expected, organizations reflecting more level of IC, and in turn, tend to put value on the use of multiple performance measures as well as the balanced use of interactive and diagnostic PMS would achieve significantly superior performance.

Relying on the one of the seminal conceptualizations of IC and from the contingency lens, this study also sets out to determine the effect of two antecedent factors, namely organizational culture and trust on the level of others four IC components. The results provided evidence that culture is associated with human and structural capital. Also, organizations reflecting a greater extent of trust tend to have a higher level of IC overall. This study provides implications to both the theoretical and practical perspectives. From the theoretical angle, this study adopts a more comprehensive IC framework than previous research through supplementing the three general IC components by organizational culture, trust, and social capital. For practical prospects, this study provides some useful guidance to practitioners and organizations in adopting suitable management accounting practices (especially the types of PMS) particularly appropriate for the level of IC in organizations, with the purpose of taking full advantage of their intangible assets.

ABSTRAK

Di peringkat global, era ekonomi berasaskan maklumat telah menggantikan ekonomi perindustrian dan runcit. Secara khususnya, ekonomi telah berubah daripada ekonomi perindustrian, terutamanya berdasarkan modal fizikal, kepada ekonomi yang berasaskan modal intelektual (selepas ini dirujuk sebagai IC). Penggunaan berkesan faktor IC terutama dalam merangkumi ilmu pengetahuan, hubungan, dan harta intelektual dianggap sebagai asas untuk mewujudkan nilai dalam persekitaran yang tinggi daya saingnya pada ketika ini. Persoalan utama yang mendorong kajian ini terbit dari sifat tidak ketara IC. Terdapat pemahaman yang terhad tentang bagaimana pelbagai jenis sumber tidak ketara ini diuruskan oleh organisasi agar kelebihan daya saing yang wujud daripadanya dapat diperolehi dan dikekalkan. Walaubagaimanapun, meskipun IC bersifat tersembunyi, organisasi mempunyai ciri-ciri lain yang lebih mudah diukur yang dikenalpasti secara umumnya bagi sistem kawalan organisasi dan sistem pengukuran prestasi (PMS) secara khususnya, yang boleh digunakan untuk menerangkan sifat-sifat dan penggunaan pengetahuan mengenainya; Tidak kira bagaimana sistem kawalan ditakrifkan, ia mempunyai satu ciri penting yang kurang diberi perhatian dalam penulisan kajiannya: iaitu kemampuannya untuk mengurus aliran ilmu pengetahuan dan IC di dalam organisasi.

Satu soalselidik tinjauan telah digunakan untuk mengumpulkan data bagi kajian ini. Pemodelan persamaan struktur (PLS) telah digunakan untuk memeriksa perkaitan yang dihipotesis. Kajian mendapati melalui penemuan menggunakan sampel daripada syarikat-syarikat tersenarai di negara Iran, bahawa terdapat hubungan yang ketara di antara tahap pelaburan dalam IC dan prestasi keseluruhan organisasi. Tambahan lagi, didapati bahawa tahap IC berkait rapat dengan tahap pengaplikasian penggunaan sistem pengukuran prestasi tertentu sama ada dari segi kepelbagaian pengukur atau jenis penggunaan PMS. Lebih penting lagi, hasil kajian mendedahkan bahawa penekanan diberikan kepada penggunaan PMS yang tertentu memandangkan ia menjadi pengantara jalinan di antara IC dan prestasi organisasi. Seperti yang dijangka, organisasi yang mencerminkan tahap IC yang lebih tinggi dan seterusnya cenderung untuk meletakkan nilai ke atas penggunaan pengukuran prestasi pelbagai serta penggunaan PMS interaktif dan diagnostik yang seimbang akan mencapai prestasi yang lebih unggul.

Menggunakan salah satu pengkonsepan berpengaruh di dalam bidang IC dan dari pandangan kontingensi, kajian ini juga dirangka untuk melihat kesan dua faktor pendahuluan, iaitu budaya dan kepercayaan dalam organisasi pada tahap empat komponen IC yang lain. Hasil kajian mendedahkan bukti bahawa budaya adalah berkait dengan modal insan dan struktur. Tambahan lagi, organisasi yang memcerminkan tahap kepercayaan yang lebih banyak, cenderung untuk memaparkan tahap IC yang lebih tinggi secara keseluruhannya. Kajian ini memberi implikasi dari segi kedua-dua perspektif teori dan praktikal. Dari sudut teori, kajian ini mengguna pakai kerangka IC yang lebih komprehensif berbanding kajian terdahulu melalui tambahan kepada tiga IC umum dengan budaya, kepercayaan dan modal sosial. Bagi prospek praktikal, kajian ini memberikan beberapa panduan yang berguna bagi pengamal dan organisasi dalam

mengguna pakai kaedah-kaedah perakaunan pengurusan yang sesuai (terutama jenis-jenis PMS) yang khusus bagi tahap IC di dalam organisasi, dengan tujuan agar aset tidak ketara dapat dimanafaatkan sepenuhnya.

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LIST OF ACRONYMS AND SYMBOLS

AVE	Average Variance Extracted
BSC	Balanced Scorecard
CFA	Confirmatory Factor Analysis
CFO	Chief Financial Officer
CSR	Corporate Social Responsibility
DM	Diversity of Measurement
EES	Executive Support Systems
EFA	Exploratory Factor Analysis
HIC	Human Capital
IAS 38	International Accounting Standard 38
IC	Intellectual Capital
ICM	Intellectual Capital Management
ICS	Intellectual Capital Statement
KBV	Knowledge-based View
KM	Knowledge Management
MA	Management Accounting
MACS	Management Accounting Control System
MAS	Management Accounting System
MCS	Management Control System
OECD	Organization for Economic Cooperation & Development
OP	Organizational performance
PCA	Principal Component Analysis
PLS- SEM	Partial Least Squares – Structural Equation Modeling
PM	Performance Measurement
PMS	Performance Measurement System
r	Correlation Coefficient
R^2	R-Squared
RBV	Resource-based View
RIC	Relational Capital
ROA	Return on Total Assets
ROE	Return on equity
ROI	Return on Investment
ROS	Return on Sale
SIC	Structural Capital
SOIC	Social Capital
SPSS	Statistical Package for the Social Sciences
TBL	Triple Bottom Line
TSE	Tehran Stock Exchange
t	critical value (t-value)
β	Beta, Regression Coefficient

CHAPTER ONE
INTRODUCTION

1.0 Overview

The central purpose of this chapter is to specifically describe the main area of the research as well as the motivation for such endeavor. Accordingly, the chapter commences with presenting an introduction and background of the study followed by outlining the problem statement. Afterwards, the objectives of the study along with the research questions are presented. The significance of the study either in terms of theoretical or practical perspective are highlighted next. This is followed by specifying the scope of the study as well as introducing briefly the context of Iran as the research context for this particular study. Finally, definitions of the research variables are presented. As can be seen, Figure 1.1 depicts the overview of chapter one of the current study.

Figure 1.1
Overview of Chapter One (Introduction)

1.1 Introduction

In today's hypercompetitive world, the adage that "knowledge is power" has a growing importance than ever before (Siegel, 2004). Organizations' knowledge-based resources are becoming increasingly pivotal to their successful operation in

parallel with the development of the global economy towards being more information-intensive. This implies that what an organization “knows” is often more critical than what it owns. According to the survey of corporate evolution with the 200 largest US manufacturing companies throughout the 20th century, only 28 firms have continued to exist (Louçã & Mendonça, 2002). In the 21st century, organizations encounter a more fierce and dynamic context that is described by the combination of globalization, advanced technology, shortened product-life cycles, and network partnerships (Cardinal, 2001; Hayes, Pisano, Upton, & Wheelwright, 2004). Nowadays, under the new world economy, the prevailing managerial practices or techniques with conventional strategic orientation such as cost cutting, benchmarking, reengineering and so forth are regarded inefficient and inadequate to reap competitive advantage (Teece, 2007). This posed an important question - what do firms do to survive?

In this respect, one important research line devotes considerable attention to intangible assets that are embedded in know-how and knowledge of manpower, databases, information technology, operating processes, customer relationship, brand, trust, and cultures (Andriessen, 2004; Kaplan & Norton, 2001). Capitalists’ basic orientation formerly was tangible assets such as land, machines and factory. Nevertheless, an organization requires moving towards uniqueness as competition became increasingly global and intense (Andriessen, 2004). Instead of tangible resources, the uniqueness does stem from intangible assets which other competitors would not be able to readily imitate. In effect, recent accounting records have revealed that the linkage between the book value and market value of an organization has been continuously reduced (Cezair, 2008). This underlines the role of the residuals, which are intangible resources that traditional accounting systems

cannot easily capture in evaluating the achievement of the company. Knowledge-based theories, which itself derived from resourced-based view of the firm, argue that knowledge is the fundamental intangible asset crucial in gaining and sustaining competitive advantage because of its essence of non-substitutable, path-dependent, and difficult-to imitate (Alavi & Leidner, 2001; Argote, McEvily, & Reagans, 2003; Nonaka, 1994; Zack, 1999). Such stress on organizations' knowledge, either in term of resources embedded within an organization or those relied heavily upon its external networks, has driven entities into a public consciousness of the notion of "intellectual capital". Intellectual capital (hereafter IC) encompasses the knowledge derived from the company's manpower, from the competencies of the firm, and from the connections and interactions between an organization and its external parties such as clients, partners, and suppliers. IC is defined as the value of organizational experience which is embedded in an organization's process, course of actions, systems, and corporate structures (Edvinsson & Malone, 1997). Intellectual property, data accumulated in knowledge management (KM) procedure, as well as KM practices which aim to capture the value of the company's knowledge resources are also incorporated in the foregoing definition (Roos, Roos, Dragonetti, & Edvinsson, 1997).

As explained above, the effective uses of the IC elements mainly consists of knowledge, relationships, and intellectual property is considered as the cornerstone for value creation in today's hyper-competitive environment. Usoff, Thibodeau, and Burnaby (2002) asserted that the emergence of such critical factors induces organizations to launch innovative strategic planning approaches for the main purpose of capturing the contributions of such crucial elements. In this regard, one of the most important areas which have evolved in line with the emergence of

Intellectual Capital is organizational control system in general and Performance Measurement System (hereafter PMS) in particular. In fact, an effective and robust PMS is a contributing factor to support management team in controlling organizational performance to assess the extent to which strategic targets have been met (Usoff et al., 2002). According to Tayles, Pike, and Sofian (2007), IC is a major determinant of value creation nowadays, and therefore it is absolutely vital that the design and the nature of management accounting system needs to be innovative adequately, whereby organizations would be able to capture the real value and contributions of such intellectual assets such as knowledge, associations, and intellectual property. However, there is a very few empirical studies directly on how the IC have made a major breakthrough in the emergence of contemporary management accounting practices (mainly include design and nature of PMS) and practitioner-oriented literature has been become a cliché (Roslender & Fincham, 2001; Tayles et al., 2007). In general, this study is aimed at connecting IC to PMS (as one of the most prominent elements of the Management Accounting Control System, hereafter MACS) as well as linking both IC and PMS to organizational performance. In other words, this research explores whether knowledge-intensive organizations have improved their PMS in parallel with the evolution of intellectual capital for the ultimate purpose of capturing the real value of such knowledge related assets. As Tayles, Bramley, Adshead, and Farr (2002) argued, managers in knowledge-intensive companies must employ innovative strategic management accounting techniques to a greater extent and place emphasis upon the assessment, valuation, and measurement of intellectual capital to prevent overlooking the firm's most precious assets.

1.2 Problem Statement

Concerning the considerable significance of IC and knowledge resources as a cornerstone of competitive advantage, a variety of different academic fields have suggested the significant association between IC and performance (Grindley & Teece, 1997; Menor, Kristal, & Rosenzweig, 2007; Subramaniam & Youndt, 2005). However, managers still experience ineffectiveness in the utilization of IC (Edvinsson & Sullivan, 1996). The absolute majority of the managers who participated in a survey carried out by the Economist and Accenture in 2003, asserted that handling intangible resources are considered as the fundamental driver towards competitive advantage. Nonetheless, most of the managers, i.e. 95 percent of the 120, contended that there is a total lack of a robust system in their companies to measure intellectual capital and the generated performance (Molnar, 2004). This issue in turn underlines this fact that theory and research seem to be ineffective so far in addressing how to explicate the nature of IC inside firms and the influence of the intangible resources on measurable performances. In effect, a precise conceptualization and definition of IC still remains disputable despite the general consensus about the importance of IC as a cornerstone for value creation. For instance, Hudson (1993) narrows the scope of the concept to merely individual knowledge. Some other scholars incorporate organizational relationships, infrastructure, culture, routine, and intellectual property into the conceptualization of IC as well (Brooking, 1996; Roos and Roos, 1997).

With the above discussion and concerning the foregoing problem, unlike previous studies, this study endeavors to conceptualize the multidimensional and complex concept of IC by incorporating social capital as the fourth element along with other three general elements, namely human capital, relational capital, and

structural capital. In addition, two antecedent variables or so-called drivers of IC i.e. organizational culture and trust, which originally proposed by Bontis (1999) as one of the seminal conceptualizations of IC framework, are empirically examined to determine their effect on the aforementioned four individual components of IC which in turn provides more robust and comprehensive conceptualization of IC. In this respect, some recent scholars in the context of IC advocate the need for developing a model incorporating the antecedent conditions that are necessary for the effective IC development (Bratianu, Jianu, & Vasilache, 2011; Isaac, Herremans, & Kline, 2009; O'Brien, Clifford, & Southern, 2010).

Based on the premise of Resource-Based View (RBV) of the firm, the uniqueness of knowledge resources plays a vital part in the organization's sustained capability to compete (Conner & Prahalad, 1996; Zander & Kogut, 1995). This in turn poses another central dilemma inside the organization which signifies that how to manage knowledge-related resources through which such competitive advantage driver is gained and sustained most effectively (Barney, 1991; Wernerfelt, 1984). For example, creating competitive advantage could derive from generating and gaining new knowledge, diffusing it across the organization, assimilating it into existing knowledge, and, eventually, employing it in order to outperform competitors (Cohen & Levinthal, 1990; Kogut & Zander, 1992; Kusunoki, Nonaka, & Nagata, 1998). However, the literature suffers from the lack of sufficient understanding of such organizational procedures in relation to handling of knowledge and intangibles. A main obstacle to achieving a more thorough comprehension can be directly attributable to the notion that knowledge resources are intrinsically intangible (Argote & Ingram, 2000). Due to the complexity in recognizing such intangible resources clearly and explicitly (Spender, 1996;

Szulanski, 2000), there is an insufficient insight on how various kinds of intangible resources, and specifically IC, are managed by the organization. In the absence of such insight, nevertheless, it becomes impossible to accurately understand the procedures through which organizations expand their distinct knowledge, and consequently the organization would largely remain a knowledge-based "black box" (Spender, 1996). This in turns raises the other concern that inspires current research. In spite of the intangible essence of intellectual capital, the organization possesses other more easily tangible characteristics which could be employed for the purpose of illuminating either the properties or exploit of its knowledge. In this respect, according to Turner and Makhija (2006), an especially helpful attribute of the organization is labeled as organizational control systems. "Regardless of how control systems are defined, they have a critical feature that has typically been overlooked in the literature: their ability to manage the flow of knowledge within the firm" (Turner and Makhija, 2006, p. 197).

This in turn underlines the fact that organizations are not able to realize their benefits if their strategic resources, mainly include IC and knowledge assets, are not managed appropriately (Coff, 1997; Widener, 2006). According to Simons, Dávila, and Kaplan (2000), PMS, as one of the major elements of MACS, is perceived as a lever to support management of strategic resources. Relevant information in relation to the organization's underlying strategic assets are provided through PMS (Kaplan & Norton, 1996). The maxim that "if you can't measure it, you can't manage it" (Kaplan and Norton, 1996 p. 21) signifies that organizational performance would be positively affected through the measurement of the organization's fundamental critical success factors such as strategic assets and capacities. This implies that some of the advantages stem from the intellectual

capital may influence firm performance indirectly through the emphasis put on the usage of PMS. As Kaplan & Norton (2001b) asserted, intangible assets seldom have a direct and immediate effect on performance, instead they typically influence organizational outcomes via chains of cause-and effect relationships involving two or three intermediate stages. Hence, it is also worth investigating the mediating role of PMS in the relationship between IC and performance.

Furthermore, the evidence shows the inconsistencies of PMS literature findings and ambiguous results which may stem from the fact that there is considerable variability in the nature and the extent to which firms apply PMS (Bourne, Mills, Wilcox, Neely, & Platts, 2000; Henri, 2006b; Usoff et al., 2002). Lee (1999) observed that more than half of the CFOs surveyed asserted that one of the major impediments to their companies' success is attributed to their incapability of developing a systematic and robust PMS. Usoff et al. (2002) claimed that, the difference could be stemming from a firm attitude towards IC. It is argued that organizations which realize the significance of IC would employ innovative PMS to a larger extent to assist in managing and capturing such critical resources. Since IC is vital in today's knowledge intensive firms, it is necessary that the design and implementation of a PMS need to be innovative enough to capture the values and contributions of such intangible factors.

With all the above arguments, to conclude, this study intends to provide insights into the foregoing claim of Kaplan and Norton (1996, 2001b) and close the gap in the existing research through the collection and analysis of empirical data by examining whether there is a relationship among the level of IC, PMS, and organizational performance within an organization. More importantly, this study

aims to investigate whether PMS would mediate the relationship between IC and organizational performance.

1.3 Research Questions

With respect to the problem statement explained in the previous section, this research mainly aims to explore the effect of two IC drivers (i.e. culture and trust) on the other IC main components. Moreover, it intends to determine the extent of IC within the organization and its relationship with PMS usage and firm performance from resource-based view. Finally, the mediating effect of PMS between the intellectual capital and organizational performance is explored. In this study, PMS fall into two broad dimensions, namely 'measurement diversity' (largely borrowed from Kaplan and Norton's BSC) and the 'PMS use' (i.e. balanced use of interactive and diagnostic PMS). Hence, the following research questions are addressed in this study:

1 What are the relationships between the antecedent variables (culture and trust) and the level of intellectual capital?

2 Is there an association between the level of intellectual capital and organizational performance?

3 Is there an association between the level of intellectual capital and the extent use of PMS (either in terms of measurement diversity or balanced use of interactive and diagnostic PMS)?

4 Is there an association between the extent use of PMS (either in terms of measurement diversity or balanced use of interactive and diagnostic PMS) and organizational performance?

5 Is there an association between the extent of balanced use of interactive and diagnostic PMS and the extent use of measurement diversity?

6 Do the ‘diversity of measurement’ and ‘balanced use of PMS’ mediate the relationship between IC and organizational performance?

1.4 Research Objectives

The current study endeavors to provide answers to the foregoing questions through accomplishing the following research objectives:

1. To explore the association between the antecedent variables (culture and trust) and the level of intellectual capital;
2. To investigate the association between the level of intellectual capital and organizational performance
3. To determine the association between the level of intellectual capital and the extent use of PMS (either in terms of measurement diversity or balanced use of interactive and diagnostic PMS)
4. To examine the association between the extent use of PMS (either in terms of measurement diversity or balanced use of interactive and diagnostic PMS) and organizational performance
5. To investigate the association between the extent of balanced use of interactive and diagnostic PMS and the extent use of diversity of measurement
6. To determine whether ‘diversity of measurement’ and ‘balanced use of PMS’ mediate the relationship between IC and organizational performance

1.5 Significance of Study

Pursuing the foregoing research objectives, this study would bring some contributions either in terms of theoretical or managerial perspective. As Petty and Guthrie (2000) argued, the preliminary stage of IC studies provides the room for scholars to introduce valuable contributions in terms of implication to practice, theory, and even methodology. Overall, this research could improve our insight concerning the effective management of knowledge-related resources, thereby reaping the maximum benefits of such critical success factor. Besides, the study attempts to induce academicians and other researchers focus more on the IC and management accounting researches.

1.5.1 Theoretical Implication

First and foremost, from the theoretical lens, this study proposes a conceptual model to synthesize literature on IC across a variety of related areas of the study. A complex and comprehensive conceptualization of IC including four subdimensions as well as supplementing two antecedent constructs (trust and organizational culture) offer a more systematic approach to incorporate several knowledge-based drivers towards performance which have been addressed individually. According to the model, it seems that the majority of the earlier studies have mainly addressed some particular dimensions of IC like human capital and structural capital, whereas social capital and relational capital have been overlooked in the literature. Through synthesizing the unique elements of IC into a whole framework, this study carries a more comprehensive set of empirical evidence for comprehending the role that IC play in augmenting organizational performances. Furthermore, as mentioned above, this study contributes to the extant field also by empirically investigate trust and organizational culture as the two important determinants of intellectual capital as

proposed by Bontis (1999). In other words, in terms of theoretical angle, this study extends extant intellectual capital literature employing a contingency perspective through investigating the effect of organizational culture and trust on the intellectual capital development. More recently, there are some scholars in the context of IC who emphasize the necessity for expanding a framework of antecedent conditions which are essential for the successful IC development (Bratianu et al., 2011; Isaac et al., 2009; O'Brien et al., 2010). Hence, the other focal contribution of this research lies in its being among the preliminary researches that explore the linkage between context (contingency factors) and intellectual capital development.

Moreover, as mentioned at the outset of this section, IC is perceived as an emerging area of study. Petty and Guthrie (2000) argued that research findings are capable of contributing to new knowledge substantially. Broadly speaking, there are insufficient works in this area because IC study is still in its infancy. More importantly, scarcely any of them specifically investigates the association between IC and MACS in general and PMS in particular (Mouritsen, Larsen, & Bukh, 2001; Tayles et al., 2002; Tayles et al., 2007; Usoff et al., 2002; Widener, 2006). Besides, none of the previous empirical studies have examined specifically the mediating role of PMS in the relationship between IC and firm performance. Accordingly, the other central theoretical contribution is that this study is placed among the preliminary researches of intellectual capital with regard to management control system in which the mediating role of PMS in the relationship between IC and performance is explored. Based on this assumption, the study also attempts to develop the literature in MCS specifically, and accounting generally.

In the management accounting and PMS literature, the majority of the empirical studies has paid much more attention to subjects associated with the diversity of measurement so far (Ittner, Larcker, & Randall, 2003; Scott & Tiessen, 1999). That is, the investigation of PMS as a whole (or multiple-feature PMS) has been overlooked in the PMS literature. For instance, in relation to the context of this study and drawing from the resource-based view, Widener (2006) found a positive relationship between the importance of performance measures usage and the importance of organization's strategic resources. There are a very few studies which simultaneously examine multiple features of PMS (Henry, 2006b is a notable exception). Henri (2006b) found that organizational culture affects both nature of PMS use and diversify of measurement from contingency lens. In this respect, however, while the influence of several contingent factors on the choice of PMS has been considerably examined in the management accounting literature (Chenhall & Morris, 1986; Henri, 2006b; Hoque, 2004, 2005; Hoque & James, 2000; Simons, 1987), little is known concerning the role that PMS play in supporting the management of organizations' most critical resources. Hence, from a different vantage point (resource-based theory), this research is aimed at extending previous management accounting literature. In other words, it contributes to the literature by addressing the PMS from two separate but complementary aspects, namely 'Diversity of Performance Measures' and the 'PMS use' (i.e. the balanced use of PMS in a diagnostic and interactive fashion) which in turn provide a more systematic and robust conceptualization of PMS. More importantly, the study contributes through exploring to what extent PMS elements are able to support the management of organizations' most critical success factors in today's hyper-competitive environment. Moreover, regarding the extending the PMS literature, the four subdimensions of the construct of the Diversity of Performance Measures

(which largely borrowed from Kaplan and Norton's BSC) were supplemented by new performance measures items classified under the heading of social and environmental perspective, (Hoque & Adams, 2008) which in turn bring about a more comprehensive and robust conceptualization of PMS.

Finally, Most of the existing studies on IC have mainly concentrated on the developed nations. Nevertheless, this concept has worldwide appeal as indicated in studies in Portugal (Cabrita & Bontis, 2008), Australia (Bontis & Girardi, 2000), Malaysia (Bontis, Keow, & Richardson, 2000), Egypt (Seleim, Ashour, & Bontis, 2004, 2007) Mexico (Trevinyo-Rodríguez & Bontis, 2007), Germany (Kristandl & Bontis, 2007), Ireland (O'REGAN, O'DONNELL, Kennedy, Bontis, & Cleary, 2001, 2005) and so forth. There are only a few studies in the literature that explore the intellectual capital in Iran (Mehralian, Rajabzadeh, Sadeh, & Rasekh, 2012; Namvar, Fathian, Akhavan, & Gholamian, 2010; Nazari, Herremans, Isaac, Manassian, & Kline, 2009). More importantly, to the best of my knowledge there is no study that addresses the issues related to the impact of IC on multiple features of PMS and firm performance.

1.5.2 Practical Implication

Proposing a comprehensive conceptualization of IC which covers two antecedent drivers (i.e. culture and trust) as well as four major IC elements (i.e. human, structural, social, and relational capital) provides useful guidance for practitioners in some ways. First of all, specifying a variety of different components of IC supports managers towards detecting, capturing, and measuring the various kinds of IC which must not be disregarded for boosting corporate performance. Nowadays, majority of executives' comprehension about intangible resources

remains restricted due to the fact that they propensity to lay emphasis on financial analyses which seem incapable of reflecting the value of intellectual capital appropriately (Molnar, 2004). Secondly, the relative significance of various IC factors to be addressed in the current study could provide a deeper understanding of managerial strategies regarding the resource allocation. In effect, organizations are facing scarce resources. Hence, managers may possibly aim to focus and invest in a specific IC dimension in order to achieve performance more efficiently (Roos & Whitehill, 1998). In addition, recognizing the diverse type of intangible assets as the contributing factor to organizational performance supports reaping the maximum benefits of such knowledge-based assets. If some IC components are substituted for one another, it is not required to employ them concurrently for achieving desirable outcomes. In this case, using those elements simultaneously may bring about decreased performance at the margin (Rothaermel & Hess, 2007). In contrast, some IC factors may complement each other well in some cases. In this condition, a knowledge resource can be supplemented by its supporting resources in order to give more rise to performance (Rothaermel & Hess, 2007).

Moreover, this study provides a contribution as a guideline for practitioners and organizations from another angle. Practitioners might be able to capture some precious guidance about developing and managing IC effectively, and what kinds of control systems in general and PMS in particular could support and facilitate the management of an organization's underlying strategic resources and eventually boost IC's contribution to firm performance. That is, this study provides some useful guidance to practitioners and organizations in adopting suitable management accounting practices (including the type and design of PMS) particularly appropriate for the level of IC in an organization, with the purpose of taking full

advantage of their intangible assets. This corroborates the idea of Widener (2006) who argued that once organizations acquire their strategic resources and capabilities, appropriate PMS would be employed in order to assist in the capturing and managing such vital resources. An important implication of this underlines the fact that where a higher emphasis on IC and knowledge-related resources takes place it might need a different stress on PMS design and nature in comparison with organizations those do not put value highly. It is imperative that managers recognize and take appropriate action based on this for the purpose of boosting organizational effectiveness ultimately.

To sum up, the linkages among intellectual capital, PMS, and organizational performance could provide a guideline for organizations and give the direction towards achieving competitive advantage by deploying compatible performance measurement system in parallel with the level of intellectual capital development. Moreover, the level and shape of intangible resources provide a checklist for companies to assess themselves in line with the extent to which they implement the management accounting practices necessary to support the management and development of such knowledge resources and capabilities. Furthermore, understanding the influence of intellectual capital and PMS on organizational performance would help executives in identifying their strategies in future development. It also underlines this fact for the mangers that intellectual capital is vital for the success of organizations functioning in turbulent and uncertain context.

1.6 Scope of the Study

The scope of this study mainly includes empirical examination of the linkage of Intellectual Capital, Performance Measurement System, and organizational

performance within Tehran Stock Exchange (TSE) companies in Iran. TSE is Iran's largest stock exchange which is based in Tehran and was first opened in 1967. Nowadays, TSE has developed into a thrilling and flourishing market in which either individual or institutional investor deal in securities of more than 330 organizations with a market capitalization of US$104.21 billion. In recent years, TSE is recognized as one of the world's best performing stock exchanges. It is a full member of the World Federation of Exchanges and a founding member of the Federation of Euro-Asian Stock Exchanges as well. TSE companies were selected since all the largest and most advanced companies in Iran are listed in this directory. This enables the sample to incorporate these largest and most advanced organizations and may be advantageous given the fact that large companies are more likely possess greater resource available for investment in knowledge-based resources and also actively engaged in more innovative MACS including using multiple non-financial and financial measures as well as balance used of PMS than small companies. Besides, all the companies' information and data are accessible widely in TSE.

In addition, this study aims to investigate the mediating role of PMS in the association between IC and organizational performance. From the management accounting control perspective, this study addresses performance measurement system from two separate aspects. First, diversity of performance measures in terms of a broad set of financial and nonfinancial measures classified under the five main perspectives (largely borrowed from Kaplan and Norton's balanced scorecard as well as Hoque and Adams, 2008) is considered. Second, the PMS use which is operationalized as the balanced use of PMS in a diagnostic and interactive fashion (Simons' levers of control) is addressed. Following the quantitative approach, the main instrument was questionnaire survey which was administered for the purpose

of data gathering. Chief financial officers/CFOs were asked to fill up the questioners on behalf of their firms. The target organizations of this research consisted of firms from various kinds of industries such as Manufacturing (Textile, Pharmaceutical, Food products and Beverage, Machinery and Equipment, Ceramic and Tiles, Cement & Lime and Plaster, Automotive, Basic Metals, Petrochemical, and etc.), the Service sector (Monetary Intermediation, Financial Leasing, Telecommunications, Real Estate and Construction, Insurance & Pension Funding, and etc.) and Mining (Iron Ores, Coal, Chemical and Fertilizer Minerals, Non-ferrous Metal Ores). Nevertheless, this research did not focus on particular organizations in terms of firm size (small, medium, large), and industry type (e.g. manufacturing, service, etc.)

1.7 Context of Iran

The country of Iran or so-called Persia is a country in western Asia. Iran ranks as 18th-largest country globally with an area of 1,648,195 km2 (636,372 sq mi). It is bordered on the north by Armenia, Azerbaijan, Turkmenistan as well as Kazakhstan and Russia to the north across the Caspian Sea. It also shares borders with Turkey and Iraq in the west, the Sea of Oman and the Persian Gulf in the south, Afghanistan and Pakistan in the east. Iran's environment and geography is richly varied and contain jungles, mountains, deserts, lakes, sea and the country is unique in enjoying four totally different seasons. Iran is considered as an ethnically diverse country and has a population of 77 million approximately. The official language of Iran is Persian or so-called Farsi, which is traced back to Indo-European language and is used and taught in all Iranian schools from the first grade. Besides, there exist some other local languages which are spoken in some parts of the country, among other things, Azerbaijani, Arabic, and Kurdish. The country

possesses one of the world's most mixed set of ethnic groups ever brought together in one realm (Yeganeh & Su, 2008). According to CIA World Factbook ("Iran"), the majority of the population is Persian with 61% followed by Azerbaijanis with 16%, Kurds with 10%, Lurs (6%), Arabs (2%), Baloches (2%), Turkmens and Turkic tribes (2%), and others (1%). Concerning the religion, Shia Islam is dominated by approximately 90-95% which is also the official state religion in Iran. Around 4% to 8% of Persians belong to the Sunni branch of Islam, largely Kurds and Iran's Balochi Sunni. The other 2% are non-Muslim religious minorities which consists of Bahá'ís, Mandeans, Hindus, Yezidis, Yarsanis, Jws, and Christians (CIA World Factbook, "Iran")

The country's political model was monarchy for more than 2,500 years. This prolonged monarchical era was ended with the advent of the Iranian revolution or better known as Islamic revolution in 1979. Currently, the country is governed under the Islamic republic and based on constitution providing for the government, legislative and judicial branches. The public vote which is held every four years appoints the president and the parliament members. Iran plays a leading part in the regional economy since it possesses the largest proved gas reserves in the world, with 33.6 trillion cubic meters. Besides, the country is ranked as third in oil reserves. It is OPEC's 2nd largest oil exporter and is an energy superpower. Iran gains huge amounts of oil revenue through the global market which is around 80% of its gross domestic product (GDP). Heavy reliance upon oil revenues could bring about economic/administrative inefficiencies. Recently, economic growth has not promoted in line with the sharp increase in the labor force which in turn causes a above average levels of unemployment (Yeganeh & Su, 2008). Based on the constitution of the country, the Iran's economy consists of three segments; the

cooperative, private, and state sectors. The economy of Iran rests upon a combination of traditional agriculture, state ownership of large companies, and small private entities. All main and crucial industries (e.g. oil and gas, radio and television, foreign trade, telephone services, aviation, and etc.) constitute the state segment. A number of key industries are governed by revolutionary foundations that comprise around 20% of the country's resources. The cooperative sector is rather unimportant and embraces entities providing limited amounts of products and services. Finally, the private segment covers SMEs companies including manufacturing and services which balance the economic activities of the state sector (Khajehpour, 2000).

1.8 Definition of Research Variables

There are six main research variables in the theoretical framework of this study (i.e. Organizational Culture, Trust, Intellectual Capital, Diversity of Measurement, the Balanced Use of PMS, and Organizational Performance) which are defined as follows:

1.8.1 Organizational Culture

Generally speaking, culture is concerned with notions of shared beliefs, values, assumptions, and significant meanings (Green, 1988; Schein, 2006). This research endeavors to capture the underlying value structure which generates meaning in organizational settings. According to Uttal (1983), culture is operationalized as the shared values (what is important) which interact with an organizations structures and control systems to create behavioral norms (the way we do things around here).

The Competing Values Model has been developed by Quinn and Rohrbaugh (1983). This model has been employed in order to investigate different organizational phenomena such as culture (Deshpandé, Farley, & Webster Jr, 1993; Quinn & McGrath, 1985; Zammuto & Krakower, 1991). Two sets of competing values along two axes constitute the competing values model: (i) the control/flexibility dilemma that embodies the preferences in relation to structure, stability, and change, and (ii) the people/organization dilemma that signifies differences in organizational focus. Four quadrants that represent four different kinds of culture (i.e. rational, hierarchical, developmental, and group culture) are arisen from those two axes (Quinn, 1988; Quinn & Kimberly, 1984). Although the competing value model has been applied for studying various organizational phenomena, it has not been employed frequently within accounting contexts (Bhimani, 2003; Dunk & Lysons, 1997; Henri, 2006b). Following Henri (2006b), this study considers the control/flexibility dilemma since this matter is pertinent to the nature of MCS and lies at the heart of current arguments in MA. The control value represents the rational and hierarchical types whereas flexibility value covers the developmental and group types of culture (Quinn, 1988).

1.8.2 Trust

Mayer, Davis, and Schoorman (1995, p. 712) define trust as “the willingness of a party (the trustor) to be vulnerable to the actions of another party (the trustee) based on the expectation that the trustee will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (Mayer, Davis, & Schoorman, 1995). Trust is taken place in the presence of either an expectation of the partner's trustworthiness, or the behavioral intention to act on that expectation (Moorman, Deshpande, & Zaltman, 1993). Trust needs uncertainty

and includes either belief in the partner's capability or confidence in the partner's benign intentions.

1.8.3 Intellectual capital (IC)

Klein and Prusak (1994) defines IC as “packaged useful knowledge”. It mainly embodies knowledge, lore, ideas and innovations (Sullivan, 2000). There is a strong consensus among IC researchers which IC falls into human capital, structural capital and relational capital despite the fact that they are not in agreement generally about the particular definition of IC (Bontis, 1998; Edvinsson & Malone, 1997; Edvinsson, Roos, Roos, & Dragonetti, 1997; Edvinsson & Sullivan, 1996; Lynn, 1998; Stewart & Ruckdeschel, 1998). However, drawing from extant literature, this study intends to supplement the fourth element labeled as social capital with aforementioned general dimensions. Social capital (SOIC) is the sum of the actual and potential knowledge embedded within the networks of mutual acquaintance and recognition among employees (Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005). The social network develops over time through informal interactions and provides the basis for trust and cooperation in an organization (Granovetter, 1985). Human capital (HIC) refers to the knowledge, specialized abilities and experience, and innovativeness of human resources. Structural capital (SIC) encompasses innovation capital (intellectual assets such as patents) and process capital (organizational procedures and processes). Finally, Relational capital (RIC) represents the knowledge of market channels, customer and supplier relationships, and governmental or industry networks. Accordingly, IC mainly contains factors such as knowledge and experience, professional skill and know-how, strong relationships, and technological capabilities, that when employed would bring about competitive advantage for an entity (CIMA, 2001).

1.8.4 Performance Measurement System (PMS)

Simons (1994a) as well as Marginson (2002) have classified PMS as one of the three main elements in management accounting. Performance measurement (PM) itself is perceived as one of the most critical, yet most misunderstood and most complicated functions in MACS (Atkinson, Banker, Kaplan, & Young, 1995). According to Neely (1998), PM refers to "the process of quantifying past action". In the same vein, Simons (1990) argued that PM is tracking the execution of corporate strategy through contrasting actual results with strategic targets. For the purpose of this study, specifically, two separate but complementary elements of PMS are addressed, namely 1) the "diversity of measurement" which embodies a wide range of integrated financial and non-financial measures (largely borrowed from Kaplan and Norton's Balanced Scorecard model) and 2) PMS use which operationalized as the balanced use of PMS in a diagnostic and interactive style in the current research (Henri, 2006a). The diagnostic use is defined as the formal feedback systems employed with the aim of monitoring predictable objective attainment whereas the interactive use focuses attention and promote dialogue and learning throughout the company through providing signals generated by top management team (Simons, 1994a).

Measurement diversity represents a general construct which is pertinent to a variety of elements: drivers versus outcome measures, subjective versus objective measures, internal versus external measures, and financial versus non-financial measures (Ittner, Larcker, & Meyer, 2003). In particular, measurement diversity indicates the degree to which managers measure and use information associated with a variety of integrated financial and non-financial indicators. In this study, the

diversity of measurement covers four dimensions of the BSC, namely financial, customer, internal business process, and innovation and learning perspective (Kaplan & Norton, 1992; Hoque & James, 2000; Henri, 2006b) in addition to some other measures which are classified under the heading of social and environmental perspective (Hoque & Adams, 2008). The BSC framework holds wide appeal as indicated in many studies in the management accounting setting (Henri, 2006b; Hoque & James, 2000; Hoque, Mia, & Alam, 2001; Ittner, Larcker, & Meyer, 2003; Jusoh & Parnell, 2008; Lipe & Salterio, 2002; Malina & Selto, 2001).

1.8.5 Organizational Performance

This study treats organizational performance as effectiveness - the degree to which a business is successful in meeting its predetermined goals or stated objectives (Mia & Clarke, 1999; Steers, 1977). Besides, performance reflects the extent to which a company is implementing a suitable strategy successfully (Otley, 1999). In the context of this research, firm performance is addressed and measured along multiple dimensions, i.e. either financial or non-financial performance rather than on any single dimension.

1.9 Organization of the Thesis

The thesis would be presented in six chapters. Chapter one presents a general outlook on the entire study. It commences with the background of IC and its related issues. The researcher defines the terminology and describes the problem statement in the field of IC, MACS, and organizational performance. Research questions, research objectives, significance of the study, and the scope of the research are presented afterwards. Besides, brief explanation of Iran's general context as well as the definitions for all the main variables of the study are provided at the end of the

chapter. Chapter two consists of an in-depth literature survey along with the definitions and conceptualizations of research variables and their dimensions including IC, PMS, and Organizational Performance. The chapter also introduces the underlying theories underpin the study namely, the Resource-based View, Knowledge-based View, and Contingency Theory.

Chapter three presents the proposed theoretical framework underpinned by the theories introduced in chapter two. Moreover, related hypotheses are put forwarded according to the stated research objectives and the reviewed literature in chapter one and chapter two in order to investigate the associations among research's variables. Chapter four provides a comprehensive explanation about the research design and methodology encompasses research paradigm and research approach, the variables measurement development, pre-testing (pilot study) procedure, data collection tools and methods as well as sampling design, and finally introducing data analysis techniques used in the research (SPSS and PLS-SEM).

Chapter five reports the results produced from the data analysis methods employed in the study. The chapter covers the following parts: data collection process, data preparation for data analysis, profiles of the sample firms and respondents, descriptive analysis and hypothesis testing. Chapter six reports the main findings of the research as well as presenting a discussion of the findings. The chapter compares the findings with the results of prior studies in the field. It introduces the potential managerial and theoretical contributions as well as providing several recommendations for either academics or practitioners according to the research findings. Finally, some of the limitations of the study and also future research are highlighted.

CHAPTER TWO
LITERATURE REVIEW

2.0 Overview

In general, this chapter reviews previous studies from the literature relevant to the research area. This review of the literature would provide a broad view of the research's constructs and variables and subsequently towards a narrow schematic view of issues addressed in this research. Specifically, the chapter aimed at providing an overview of the literature on the variables of interest, namely intellectual capital, performance measurement system, and organizational performance followed by addressing and specifying the gaps within the related literature. The chapter also discusses the theories underpin the study as well as its relevance to the research's framework. The final section provides an explanation regarding the connections and linkages among all constructs of the study.

Broadly speaking, a literature review has a more important part to play in filtering the extant literature in a specific field and draws the conclusions about state-of-art in that field. Rowley and Slack (2004, p. 32) specified the pivotal role of literature reviews in the following aspects (Rowley & Slack, 2004): (1) Supporting the identification of a research topic, question or hypothesis; (2) Identifying the literature to which the research will make a contribution, and contextualizing the research within that literature; (3) Building an understanding of theoretical concepts and terminology; (4) Facilitating the building of a bibliography or list of the sources that have been consulted; (5) Suggesting research methods that

might be useful; and in (6) Analyzing and interpreting results. Nevertheless, it is not required that every literature review ought to deal with all foregoing aspects. On the contrary, the objective of the review might be very particular which considers any one of these aspects.

2.1 Intangible Assets

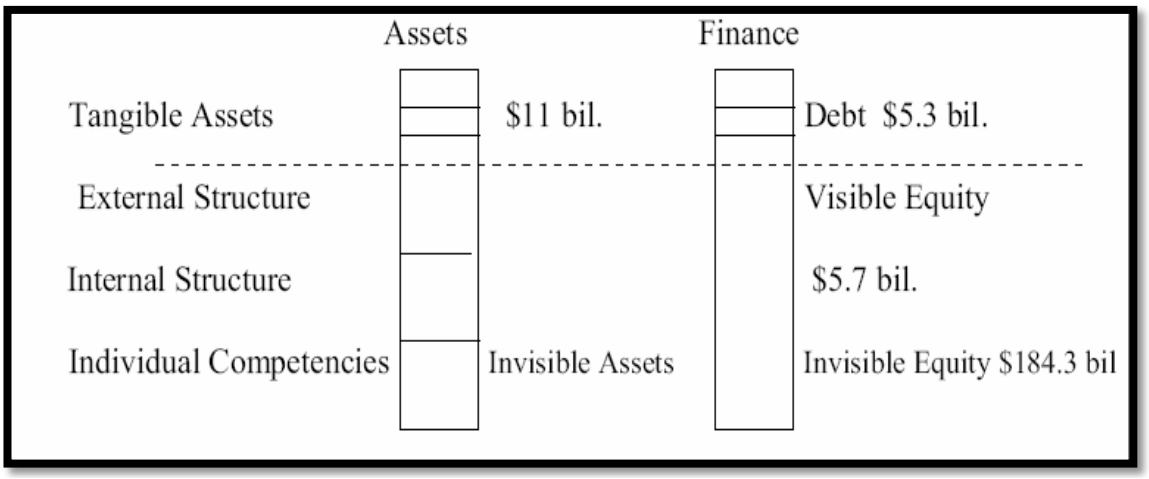
As elaborated in chapter one, Intellectual Capital (IC) is served as one of the main variables in this study. However, there are other concepts within the literature, such as “intangible assets” and “knowledge assets” that are almost interchangeable with IC. As Lev (2001) argued, the concepts of intangible resources, knowledge assets, and IC are frequently applied. Intangible resource is generally used in the context of accounting literature while knowledge asset is more prevalent in the economy. Also, intellectual capital is commonly used within the context of management and legal literature. Nevertheless, all the aforesaid terms and concepts carry the same meaning which reflects a “non-physical claim to future benefits” (Lev, 2001, p. 5). According to Petty and Guthrie (2000), the concept of IC is often treated as a synonym of “intangible assets”. Nevertheless, some definitions treat intangible assets as a broader concept. For example, the definition presented by the Organization for Economic Co-operation and Development (OECD, 1999) places IC as a subset of, instead of the same as, the overall intangible asset base of a business (Petty & Guthrie, 2000). OECD (1999) defines IC as “the economic value of two categories of intangible assets of a company: (1) organizational (“structural”) capital; and (2) human capital. Hence, as a broader concept, the chapter commences with a brief explanation about intangible resources followed by focusing primarily on IC as the focal center of interest in this research.

The intangibles have attracted wide attention within many fields such as economics, accounting, and strategic management. Understanding the intangibles is quite cumbersome for entities in the wake of total lack of awareness about such critical factors, where financial information is crucial (Tayles et al., 2007). Within the context of accounting, intangibles are those resources which are not in a physical shape like goodwill, patents, brands and customer relationships. Such resources bring invisible earning which in turn bring about promising cash flows. According to Leadbeater (2000), intangibles embody the resources which are difficult to assess. For instance, assets such as know-how, particularly the tacit knowledge, experiences, innovativeness and aptitudes are classified under the intangibles resources. Know-how of an organization only would be precious in the presence of knowledge embedded in the firm's relationship with its external parties such as customers, suppliers, investors, and so on (the synergy between know-how of the company and know-how of the third parties). Leadbeater (2000, p. 11) comments that

"…intangible assets have become so much more important as a source of competitive advantage precisely because it is so difficult to pin them down, break them up, parcel them out and for competitors to imitate them. But that is also why it is so difficult for investors, accountants, managers and knowledge-holders to value intangibles."

In Figure 2.1, Karl-Erick Sveiby (2002) demonstrates that how invisible assets or so-called intangible resources value augments the market value of an organization. As can be seen, the figure compares book and market values belongs to Nokia Company at the exact same date. The market value per share at that time was $40.90, amounting to a total market value of $190 billion. Consequently, as can be seen, the difference between the book value (i.e. $5.7 billion) and the market value (i.e. $190 billion) is a tremendous amount ($184.3 billion). Nevertheless,

there is not a possibility that this considerable amount could be reflected and disclosed on the conventional financial reports since it is far beyond the scope of traditional accounting system. A rationale for not reporting its hidden value can be attributable to this fact that current stock prices are indicative of the near future, and fluctuates in tandem with the economy. Assume that Microsoft, for instance, wish to purchase Nokia. In this case, how much would it cost? It would cost Microsoft $190 billion. The $183 billion will be labeled 'goodwill' and be reflected in the conventional financial accounting. Accordingly, the hidden/intangible value will become completely visible/tangible (see Figure 2.1).



Source: Sveiby (2002)

Figure 2.1
Invisible Balance Sheet

Nowadays, organizations' products, which are inherently incorporeal, are strongly oriented towards technically advanced and knowledge-intensive form by virtue of dramatic changes in the modern economy. In other words, knowledge is regarded as the unique feature for production in the global economy because of some technical and competitive reasons. Some organizations, particularly those possess state-of-the-art technology like IT (Microsoft) or advanced pharmaceutical

companies (Pfizer and Merk), enjoy a substantial and high 'market-to-book ratio'. According to Leadbeater (2000), the rationale behind this is that book value fails to align itself properly to the changing asset base of contemporary organizations.

Entities are moving towards realizing that technology-oriented capabilities cannot be a sustained superiority. Instead, they are very conscious of the fact that intangible capital remains their only edge. According to Roslender and Fincham (2001), information is inadequate vis-à-vis intangibles in financial statements. As Bontis et al. (2000) argued, scholars in the context of policy and accounting have expressed their special interest in knowing that how knowledge resources reflect on the performance of the organizations. Lev (2002, p. 5) argued that:

"The current industrial era-based accounting system regards most intangibles as expenses as if they were devoid of future benefits, thereby introducing serious biases to corporate balance sheets and income statements. It has been empirically shown that these reporting deficiencies cause serious social harms, such as excessive cost of capital, large insider gains and manipulation of financial reports."

In order to deal with these challenges, Lev (2002, p. 6) proposed that

"Current financial reports should be expanded to comprehensive disclosures, portraying in addition to the consequences of past transactions (the current system), a fair representation of the networking activities of the company, the obligations undertaken (executed as well as unexecuted), and its risk profile. Assets should include both tangible and intangibles. This is, of course a major endeavor, but a possible one, if such a comprehensive disclosure will be placed on the top of standard-setters (FASB, SEC) agendas."

2.1.1 Accounting for Intangibles

Stock market price for companies could significantly differ from net asset values. This is partly attributable to this fact that the financial reports are unable to

indicate the real value of all the intangible resources. Considerable endeavors have been devoted for inclusion of the value of intangibles in a formal reporting structure. This largely because that numerous companies have realized that the financial reports are not efficient anymore as a lever facilitating momentous decision-making (Petty & Guthrie, 2000).

According to Gröjer (2001), the global organization is strongly oriented towards resources with more immaterial than material nature, where assets in various immaterial shapes play a crucial role in improving businesses. Gröjer (2001) considers this progress as a dilemma in financial accounting taxonomy. This advance, in the area of accounting, is embodied by notions such as intellectual capital, immaterial resources, and intangibles. He also pointed out that there are calls to revert to simplification, and return to the ease of reclassification. As summarized in table 2.1, three of the guides to classifying intangibles include International Accounting Standard 38 (IAS 38, issued by the International Accounting Standards Board), Balanced Scorecard (BSC), and IC are compared and constructed according to the following titles: clarity of concept, attribute, exhaustiveness and exclusiveness, and simplicity. IAS 38 is imperative, since intangibles are directly under its influence. BSC has an edge for the reason that it is frequently applied and creates a link among nowadays intangibles and tangibles in a cause and effect relationship. IC is also important as it represents the moment where tangibles are divided into intangibles. As per Johanson, Mårtensson, and Skoog (2001), investors and analysts are adamant in their desire to be independent of intangible information; due to the fact that they worry that the external disclosure is not in line with inner measurement practices.

Table 2.1 Contrast among IAS 38, BSC and IC

Types of Classification	Clarity of Concept	Attribute	Exhaustiveness and Exclusiveness	Simplicity
IAS 38	Vague: Anything without physical substance can be intangible, except for a few mentioned items and anything that is similar to those items.	(1) Recognition: Can intangibles be recognised? : Conservatism accounting exponent (2) Origin (essentialist): Where do intangibles originate? – Internally or externally acquired?	Exhaustive because of general definition of objectives of states of events in the universe of discourse.	Objectively and subjectively unclear.
BSC	Vague: Difference between intangibles and non-intangibles is of no importance. Emphasises difference between performance drivers and their outcome.	Specific time: past, present or future.	Borderlines between especially internal business process and innovation or improvement are unclear. Perhaps such ambiguity is necessary in modern organisations.	Lacks objective-notional simplicity because of its multi-dimensional concept that can be given several meanings.
IC	Rhetoric: Difference between market value and book value. Amount changes as soon as share prices change or when accounting practice changes.	Attribution of IC into sub-classes is also based on some hidden properties of 'overall similarities' related to a 'value to the business'.	Cannot be fully exhaustive. When using a subtracting technique, something must be left over if the order of subtraction should matter.	Relation is direct opposition. Objective-notional simplicity high because it tries to establish linked concepts, but link goes through 'capital' concept.

Source: Gröjer (2001)

2.2 Intellectual Capital

Intellectual capital (IC) is classified under the most influential factors in today's information age era which characterized by modern technology in information and communication. IC is specifically crucial of importance in knowledge-intensive organizations. According to Petty and Guthrie (2000, p. 157), the significance of IC is highlighted in:

1. The revolution in information technology and the information society,

2. The rising importance of knowledge and the knowledge-based economy,

3. The changing patterns of interpersonal activities and the network society,

4. The emergence of innovation as one of the principal determinant of competitiveness.

During the last two decades, a plethora of studies have placed value prominently on intellectual capital as an important driver and indicator of national and international economic development (Bontis, 1998; Bontis et al., 2000; Cabrita & Bontis, 2008). A new perspective into the fact that markets are shifting from industrialized to knowledge-intensive economy. Knowledge economy is not only pertinent to high-tech or knowledge-based businesses, but is heavily dependent upon acquisition, development, and sharing of knowledge as its cornerstone of economic progress, prosperity and development within other industries (OECD, 1996). Foray (2006) asserted that, knowledge is created and disseminated by entities successfully in order to develop a knowledge economy which places strategic value on the development and leveraging of human capital via training and education. The power of the information age economy has highlighted the importance of delineating and measuring IC (Joshi, Cahill, & Sidhu, 2010; Roslender & Fincham, 2001). Despite all the efforts to develop and use several techniques for IC evaluation (Andriessen, 2004; Chan, 2009; Pike & Roos, 2004), the standard models of financial reporting and accounting regulations are not completely sufficient to assess IC value and knowledge economy (Kujansivu & Lönnqvist, 2007; Lev & Zarowin, 1999). Bontis (2001), noted that the abundance of literature on intellectual capital flows from an accounting and financial perspective.

According to Sharabati, Jawad, and Bontis (2010), there are two issues which attracted the attention of many researchers in this area: (1) “What is causing firms to be worth so much more than their book value”? (2) “What specifically is in this intangible asset”?

The following sections review comprehensively the evolution of IC research along with various definitions, classifications, and conceptualizations of IC. Remaining questions and gaps for Intellectual Capital research is discussed afterwards.

2.2.1 Intellectual Capital Creation

Intellectual Capital is perceived as an organization’s competencies (Reich, 2010). It is internally oriented at the beginning, and is closely linked to the capabilities of the participants. This could engender the values, since the participants make up an organizational system that promotes mutual co-operation and co-ordination, and this in turn paves the way for exchanging of knowledge as well as new knowledge creation. According to Teece (1998), exchanging and creating knowledge should not be the only factors stressed upon, but stress should also encompass knowledge deployment and usage. Nevertheless, the competency of an organization is not only internal, but environmental as well. In many cases, the network of organizations in which the company is part of it would bring about knowledge creation. That is, interactions among and the co-operation of organizations can engender and stimulate innovations. Organization is not able to create value all by itself; instead it requires the backup of other entities existing on either side of the value chain. The IC of a particular company hinges upon the features of the network and the company’s position vis-à-vis the network (Arora & Gambardella, 1990; Van der Meer-Kooistra & Zijlstra, 2001). The creation of value

and growth or so-called innovation is an outcome of a network of companies rather than an output of an individual company.

To sum up, IC could be formed and generated either internally or externally. For instance, work procedures and processes that are byproducts of organizational procedures and managerial systems, manpower's innovation, and company technology can be considered as cases of internal IC creation. On the other hand, certain examples of externally-created IC are value added by means of company relationships with outside parties such as customers, suppliers, and strategic partners, which are reflected by reputation and image, customer loyalty, and coordination procedures with suppliers (Van der Meer-Kooistra & Zijlstra, 2001).

2.2.2 Intellectual Capital Measurements

An organization may intend to employ a system to measure its IC. As explained earlier, intangibles are precious resources and pivotal to organizations since they could determine their future. Accordingly, it is imperative that firms embark on capturing and measuring IC to extract valuable information through which managers can take right and effective strategic decisions. As Roos (1998) asserted, the process of measuring IC is so difficult. The rationale behind such difficulty is threefold: (1) Time delays, (e.g. human resource training) (2) IC is not perceived as a zero-sum game (this implies that a tiny amount of investments may engender huge profits, and substantial investments may bring about zero income) (3) Intangibles are quantified on non-financial aspects such as hours and ratios, rather than mere financials. According to Roos (1998), in order to measure intellectual capital, an organization ought to "go beyond financial indicators, have a

clearly defined business orientation, and a distinct operational commitment to moving ahead."

As Johanson et al. (2001) argued, dozens of conceptualizations and frameworks have been put forwarded for measuring intellectual capital, among others, Human Resource Accounting for human resource in the 1960s, and Balanced Scorecard (Kaplan & Norton, 1992), IC, and Intellectual Asset Monitor in the 1990s (Sveiby, 1997). In this context, Johanson et al. (2001) posed some questions, which were (1) what are the kind of intangibles measured? (2) What method is used for measurements? and (3) What are the measurements being utilized for? Taking into account three organizations in the investigations, the scholars confirmed that a formal measurement routine (MR) can be a conduit that creates 'tacit' knowledge vis-à-vis norms (search rules) and activities (routines), whereby there would be a possibility for more readily networking of a huge number of personnel, customers and analysts. There have not any formalized MRs so far, although several informal MRs have been embarked upon. In effect, MR is a type of management control and is a tool employed for evaluating performance to enable intangibles by which the value of the stock of knowledge would be augmented. According to Sveiby (1997, p. 74), "If we measure the new with the tools of the old, we won't see the new". 21 accepted models exist for IC measurement (Bontis, 1999; Sullivan, 2000).

2.2.3 Intellectual Capital Reporting

Mouritsen et al. (2001) posits that IC statements are 'new' forms of reporting whose object is knowledge management activities. Several firms, including the Danish Agency for the Development of Trade and Industry, the Copenhagen Business School of the University of Aarhuss, a consultant company, in addition to

17 other companies involved in a project to scrutinize how the 17 companies will launch ICS utilization (Mouritsen et al., 2001). The major elements of ICS are put into practice by these entities. The undertaking began in February 1998, and the companies agreed to embark on and disclose ICS for the years 1998 and 1999. The companies attended several meetings (eight sessions during one year) to talk about their progress. Meanwhile researchers gave feedback about their operations and practices by providing explanation of what they were carrying out and of how they comprehended the IC.

Drawing from the findings of the Danish Project, Mouritsen et al. (2001) observed that there is a lack of a certain framework for ICS as well as they do not provide a bottom-line measurement for capturing the IC. It was assumed that ICS is situational and leveraged by companies to enhance the implementation of strategies instead of reporting historical findings. The concern is not only metric, but with changes in activities that are visible and legitimized by narrations. It is not viable to isolate measurement from the process since they collectively maintain the language and practices of IC. The ICS are not indicative of the organization's intellectual capital, but are more reflective of their KM practices. The metrics, narrations, together with the KM practices, are building blocks of the ICS. The companies accepted that they fail in their attempt to find their ideal framework of ICS.

Van der Meer-Kooistra and Zijlstra (2001) participated in the PricewaterhouseCoopers (1998) ("PwC") dealing with the Dutch Economic Affairs project in 1998/1999 that aims to recognize and gauge the intangible resources of 3 knowledge-intensive organizations. As per their suggestions, the IC internal reporting must encompass knowledge and experience possessed by employees (explicit and tacit knowledge), organizational system and processing that supports

the creation of IC, innovation and technology, and business relationships (business network and customer network). Van der Meer-Kooistra and Zijlstra (2001) also advised that the characteristics of external reporting mirrors a standard structure and reliability and objectivity, sans the integration of financial reports, due to the fact that financial accounting is regarded as backwards, whereas IC is regarded as the future.

Van der Meer-Kooistra and Zijlstra (2001) highlighted the fact that underlying assumptions must underpin the reporting model. It is their opinion that both the literature and results pointing to the fact that perspectives from a manager is duly required. Information regarding the value-creation capacity of firms must be provided prior to any undertaking. This capacity is incumbent upon ongoing activities and procedures inside the organizations, and hinges on the knowledge and experience of internal participants and organization's management in deploying and utilizing the stipulated knowledge and experience. An IC report must be inclusive of these facts, which in turn require a deep comprehension of both facets and their influences vis-à-vis, an organization's value. Also, due to the fact that internal insights on the role of IC are duly required within the value-creation capability of firms, the model that will be reported should base itself on cause-effect relationships. The information that will be given should encompass variables that precipitate fluctuations in IC resources. The model should also be flexible enough for the integration of information pertinent to flow and effect.

Frameworks on IC reporting (Brooking, 1996; Edvinsson & Malone, 1997; Sveiby, 1997) rely on managerial viewpoints. It aligns IC-creating practices and procedures with strategy, and provides information in relation to IC creation in

comparison to organizations' targets. They are also designed to conform to Kaplan and Norton's (1996) Balanced Scorecard. IC information is not included in the conventional financial accounting framework by any of the foregoing models. Roslender and Fincham (2001) argued that markets influences, and ultimately determine, a second assessed value of businesses. Beginning the mid-90s and within the real business world, there has been ample evidence which witness the existence of the considerable differences between the two assessments. Such discrepancy is generally attributed to the current constraint within the accounting structure which put obstacle in the way of reporting on goodwill developed internally over time. Based on some scholars, among others, Edvinsson and Malone, (1997), Stewart (1997), and Sullivan (2000), there are notable examples of big market values versus book value ratio belonging to Microsoft, with an 11.2 ratio (1996). According to Lev (2000), such large ratio can be stemmed from a new value-creating source, which is labeled as intellectual capital, or the 'new' goodwill. Dzinkowski (2000) elaborates the story as follows:

"Standard accounting models were designed for informing company management and stakeholders on stocks and flows of (financial) value. Most of these are quantifiable and subject to generally accepted accounting principles and practices (GAAP). In contrast, intellectual capital is a relatively new and enigmatic concept, relating primarily to the intangible, highly mutable assets of the firm. As such, the current accounting model does not adequately capture their value nor represent them in a concise, meaningful format" (Dzinkowski, 2000: 32- 33).

Dzinskowski (2000) rightfully posited that accounting profession can be at risk unless it would be able to develop novel financial and management accounting concepts and practices to accommodate the accounting for intellectual capital. According to Roslender and Fincham, it is a rather complex undertaking to integrate IC into conventional accounting, since this very act would act to challenge the principle of objectivity. It is very subjective to quantify the IC given to the fact

that the IC is inherently intangible. For instance, it seems awkward for a company to capture the real value of manpower's knowledge and expertise, customer information, and distribution channel, and so forth. Since the 1960s considerable efforts have been devoted for including human asset into the accounting model. They are labeled as human asset accounting, human resource accounting, and human worth accounting (Sackmann, Flamholtz, & Bullen, 1989). As Johanson et al. (2001) claimed, nevertheless, they have not been widely acknowledged. This, in turn, underlines the fact that why some organizations (e.g. Skandia AFS and Celemi of Sweden) prepare IC statements that mainly embrace stories and narratives of their IC (Johanson et al. 2001).

2.2.4 Intellectual Capital Management (ICM)

The intangibles must be managed for the purpose of fully exploiting human and structural capital. Edvinsson and Malone (1997) believe that ICM allows organizations to simultaneously leverage human and structural capitals. Wiig (1997) pointed out that ICM is somewhat beyond the knowledge management (KM). According to Wiig, ICM is aimed at renewing and maximizing the value of the organization's intellectual capital. He further discusses that,

"Progressive managers consider ICM and KM to be vital for sustained viability. Recent practices support this notion and have provided important approaches and tools. ICM focuses on renewing and maximizing the enterprise-wide value of intellectual assets. KM supports ICM by focusing on detailed systematic, explicit processes overlap, and synergy between ICM and KM. Advanced enterprises pursued deliberate strategies to coordinate and exploit them. From ICM perspectives, they create balanced intellectual capital portfolios that they implement with KM approaches and tools" (Wiig, 1997: 399)."

Edvinsson (1997) is of the believe that the challenge lies in the very act of process management that involves the development of IC via the generating of

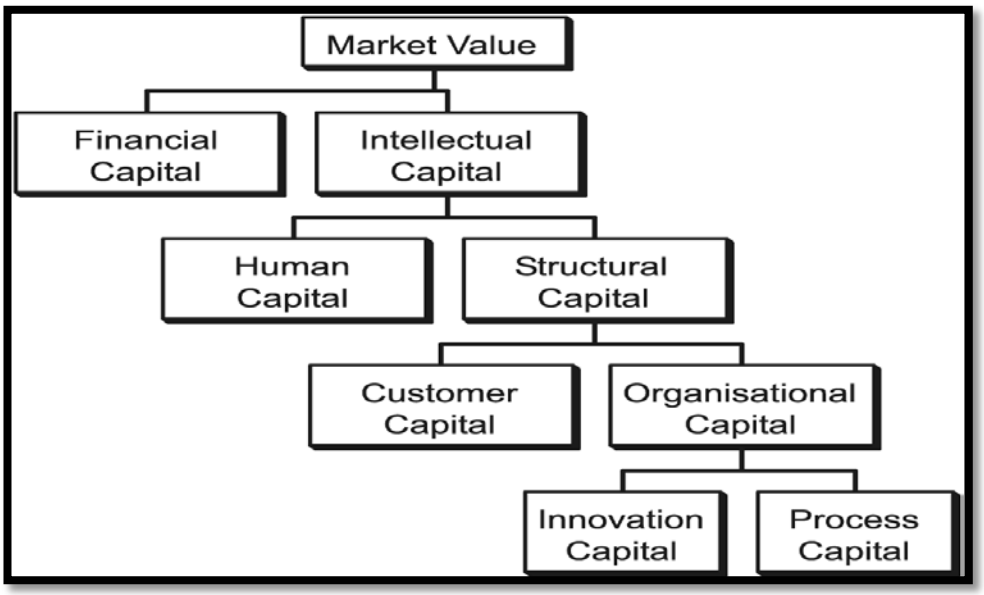
values, to collecting, capturing, and knowledge sharing, to leveraging and capitalizing of the said values. Knowledge management intends to enhance value creation of an organization via the efficient utilization of knowledge. IC, on the other hand, enhances an organization's capability in the context of value generation via the identification, capture, leveraging, and recycling IC, which encompasses value creation and extraction. A crucial factor of IC is called 'organizational capital', which refers to "the use of structural competence and knowledge for recycling, leveraging and sustainability" (Edvinsson, 1997, p. 372). The whole process involving value creation should end up with value-adding organizational capital. The Navigator concentrates upon value creation, whereas organizational capital emphasizes value extraction. As per Edvinsson (1997), the correct management of IC is advantageous to an organization, which will invariably result in a steeper learning curve, a shortened lead time to application; increase in costs and investments, or the recycling of structural and organizational capital; increased value added due to enhanced interactions, and finally, fresh value creation through established connections and combinations.

2.3 Intellectual Capital Research Evolution; IC Conceptualizations

The general consensus in the IC literature is that IC falls into human capital (the skills, know-how, and experience owned by manpower), structural capital (procedures, manuals and administrative systems), and relational capital (the network of connections of external parties with the firm, such as customer loyalty, product brands, and corporate image). The definition encompasses invention, ideas, general knowledge, designs, computer programs, data processes, and publications, and is not confined to technological innovations or intellectual property identified by law (patents, trademarks, trade secrets).

As pointed out by Edvinsson and Sullivan (1996) as well as Edvinsson and Malone (1997), IC can also be defined as applied work knowledge in the context of value generation, where the scholars underline IC's value creation capabilities. Certain manpower has direct value generation capabilities; example of this includes lawyers in legal organizations and counseling clients on legal matters. However, there are also employees that income generating capabilities are indirect of different; examples include programmers in software firms. Such programs are regarded as intellectual assets that are reproduced and offer to clients. The Edvinsson and Sullivan (1996) define such intellectual assets, which classify under the structural capital, as "the codified, tangible, or physical descriptions of specific knowledge of which the company can assert ownership rights and that they can readily trade in disembodied form". According to Edvinnson and Sullivan (1996), intellectual assets are further fall into three parts include commercializable assets (products, processes and services), customer-based capital (relationships, agreements and history), and structure related capital (plans, procedures and processes).

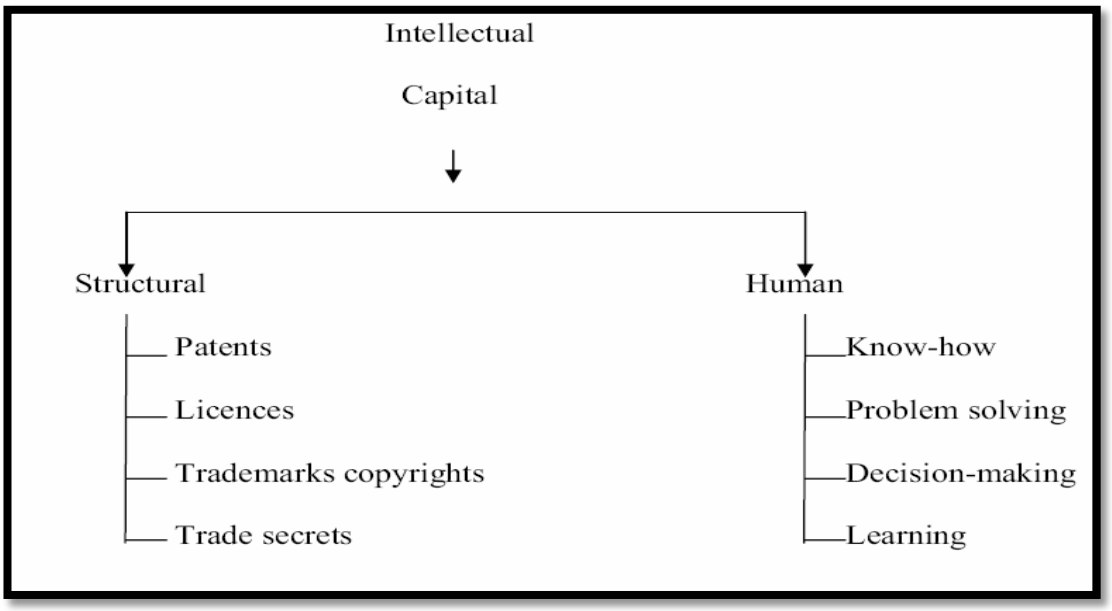
According to Edvinsson & Malone (1997), IC can be classified into two distinct capitals; human and structural. Structural capital can be further divided into customer and organizational capitals. Furthermore, organizational capital covers both innovation and process capital. These definitions and details were derived from a model constructed by Skandia, a Scandinavian organization involved in IC reporting, where Edvinsson served as director for IC-related matters (see Figure 2.2).



Source: Edvinsson and Malone (1997)

Figure 2.2
Skandia Value Scheme

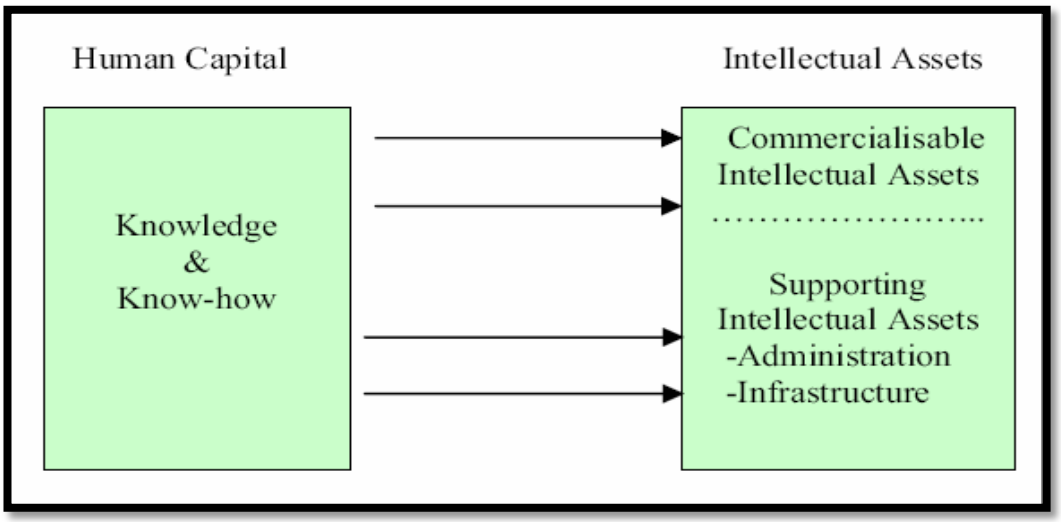
Robinson and Kleiner (1996) believe that know-how, problem solving skills, decision-making abilities, and learning are examples of human capital. They asserted that those organizations that possess such assets to a larger extent and exploit them for creating value would be more highly valued in the market. Besides, they noted that structural capital arises from human capital, and examples of structural capital include patents, licenses, trademark copyrights, and trade secrets. Figure 2.3 depicts the schematic classification of IC components based on Robinson and Kleiner (1996).



Source: Robinson and Kleiner (1996)

Figure 2.3
Schematic breakdown of IC

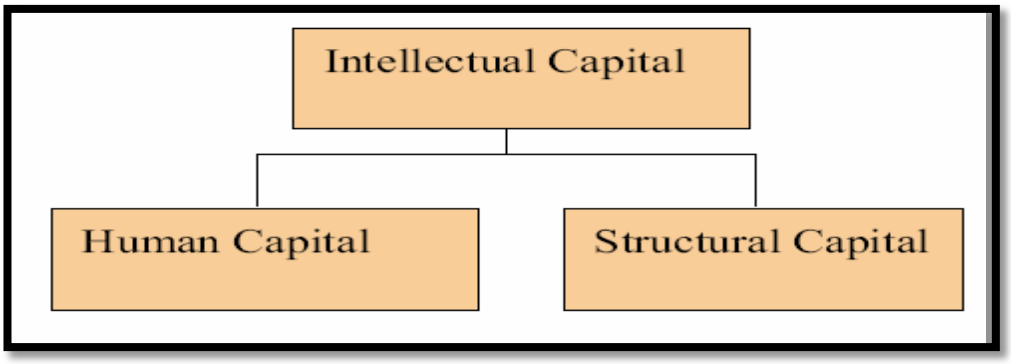
Sullivan (2000), who believes that IC is equivalent to knowledge, advocates the approach of Robinson and Kleiner (1996). He proposes that IC principally embraces “knowledge, lore, ideas and innovations”. Sullivan divided IC into human capital and intellectual assets. The manpower and their knowledge and expertise embody the human capital which is not directly commercializable. In contrast, intellectual assets that include fresh ideas or innovations can be converted to commercializable resources, where firms are able to assert the rights of ownership (see Figure 2.4). Therefore, as Sullivan showed, it can be advantageous to the organizations to convert the novel knowledge or know-how of their manpower into commercializable capital (tangible assets or services) and supporting intangible resources like administration and infrastructure.



Source: Sullivan (2000)

Figure 2.4
Major components of IC

In the same vein, Roos, Roos, Dragonetti & Edvinsson (1997) is a fervent believer of Robinson and Kleiner's (1996) standpoint, where IC falls within the gamut of human and structural capitals (see Figure 2.5). Roos et al. (1997) also corroborated the work of Sullivan (2000). It was pointed out in Roos et al. (1997) that human capital can be found in individuals or companies, while structural capital is woven into an organization and therefore is associated with the firm's presence within the marketplace (commercializable or promotes the organization's business).

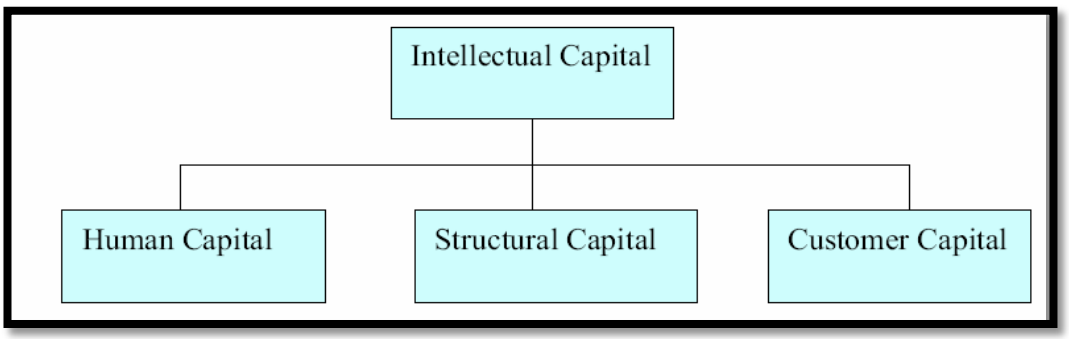


Source: Roos et al. (1997)

Figure 2.5
IC Breakdown

According to Mouritsen (1998, p. 462), IC is a matter of "broad organizational knowledge, unique to a firm, which allows it constantly to adapt to

changing conditions". The notion of Mouritsen (1998) regarding of IC is strikingly similar to Hamel and Prahalad (1994), that is to say IC as company's competencies. IC is strongly associated with the individual competence such as knowledge, experience and know-how of the manpower within the entity at primary internally focused. Their competence could lead to value creation if an exchange of knowledge leads to the creation of fresh knowledge. Tayles et al. (2002) posited that IC embodies the total stock of human capital, or knowledge-based equity possessed by an organization. A company ought to capable of classifying such resources, recognizing their propping up of strategic targets, capturing contributions, and take into account how the resources compare to those of their rivals. This approach seems to be considerably different. That is, although the others highlight IC emphasis upon the external factors, it is often confined to relationship with customers (Van der Meer-Kooistra & Zijlstra, 2001). Along the same line, Sveiby (1997) suggested a model towards extending the classification of IC into human, structural, and customer capital (see Figure 2.6).



Source: Sveiby (1997)

Figure 2.6
Categorization of IC

Roos et al. (1997) regarded knowledge as an element that makes up IC; however, IC, by itself, is perceived as being much more than knowledge. IC is not regarded as an information-based asset, it is instead perceived as being knowledge-

based. Knowledge is a personal, subjective process that comes from prior experiences and present events, whereas information is objective and molded by the surroundings. They correctly expected that the management must devote balanced attention to both IC and financial capital equally. Hence, managers should constantly endeavor to capture, manage, and leverage IC, thereby creating real value for their organizations. This is not easily accomplished and strenuous efforts are required to go through such procedure. In this respect, organizations should comprehend the IC concept firstly and the concept behind it as well.

According to Brooking (1997), IC is the difference between the book value of the organization and its market value. This difference is manifested in the amount of hidden or "unrecorded value" which is not typically reflected in the balance sheet. Dzinkowski (2000) argued that this excess value approximates an organization's IC. There are four types of IC as detailed below:

1. Market Assets: bring the organization supremacy in the market (e.g. trademarks, customer loyalty, repeat business, and so forth.

2. Intellectual Property Assets: embody property of the mind, for example patents, trademarks, copyright, and etc.

3. Infrastructure Assets: bring the company inner power, such as organizational culture, administration and business procedures, power stem from IT systems, and so forth.

4. Human-Centered Assets: arising from the manpower who works in the company, for instance their know-how, skills, knowledge, networking capacity, and etc.

Brooking (1997) elaborates more that market assets encompass market positioning, brands, and company name. On the other hand, infrastructure assets

include management philosophy, corporate culture, management and business processes, financial relations, IT systems, and methodologies. Infrastructural assets are pivotal to companies, due to the fact that they bring about order, security, accuracy and superiority for them. Examples of human-centered assets are collective expertise, creativity and problem-solving skills, leadership, and entrepreneurial and managerial capabilities. These assets are in turn reflected by the inherent manpower of a company (Bontis, 2001). These assets are in a prominent position in firms, inasmuch as they are the qualities that make up manpower and cannot be possessed by the company.

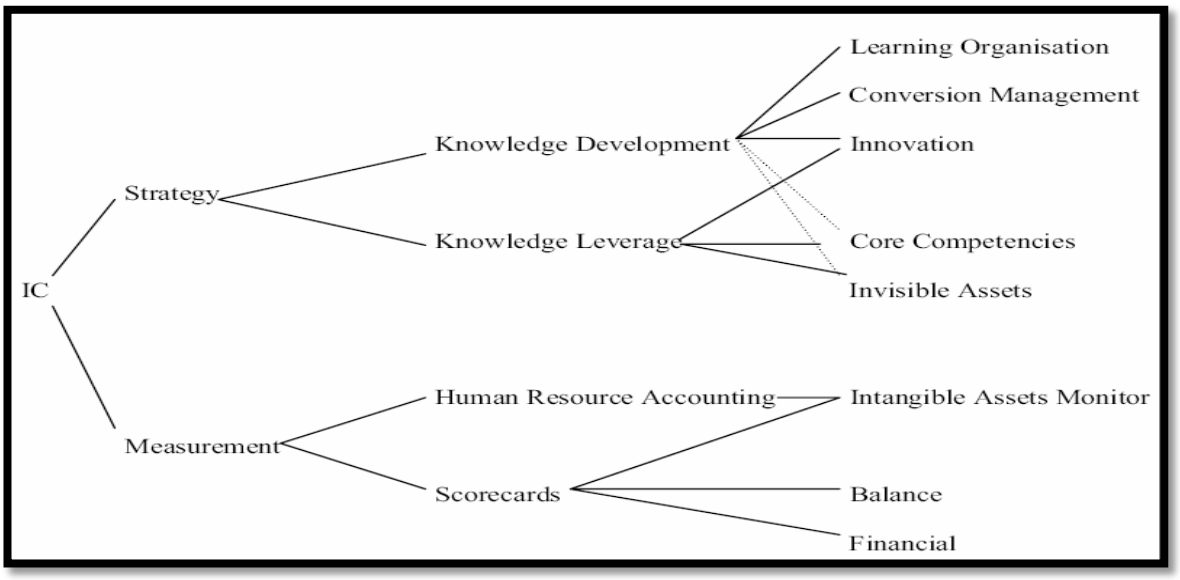
According to Klein and Prusak (1994) IC is defined as: “intellectual material that has been formalized”. Van der Meer-Kooistra and Zijlstra (2001) disagreed with Klein and Prusak. They asserted that their definition restrict IC to formalized and captured intangibles merely. That is, based on Klein and Prusak, IC are indicative of intangibles that are already being documented and made explicit (e.g. processes, patents, brands, and copyrights), while IC must incorporate resources which are not formalized and captured like people’s tacit knowledge and skill.

As Kennedy (2001) proposed, things such as knowledge of a veteran chef, an automobile engineer, and a gemologist in their special skills and knowledge could be considered as some cases of tacit knowledge. Kennedy holds that a chef recognizes that a particular cooked food is fine through only testing its texture or observing its color. Also, an engineer can discern a car problem just by listening to its engine, while a gemologist can tell the value of a gemstone just by looking at its color. Kennedy (2001), nevertheless, argued that there are some kinds of tacit knowledge that are not easily convertible to explicit knowledge. It requires time to master, and the aforementioned examples define such knowledge; experimentation

and practice are prerequisites to master them. Kennedy posited that although tacit knowledge is represented by members in an organization, it is regarded as assets belonging to firms, due to the fact that these members are on their staff. The staff is accordingly perceived as ‘asset’ of the firms. Brooking (1998) describes staff as human-centered assets whereas others scholars such as Robinson and Kleiner (1996), Edvinsson and Malone (1997), Roos et al. (1997), Sveiby (1997), and Sullivan (2000), describing it as human capital.

There were some other approaches prior to and as the antecedents of IC framework, among others, Human Resource Accounting, Human Resource Cost Accounting and Utility Accounting. These approaches are never acknowledged by companies, due largely to the ambiguity in the fact that what constitute a capital or an asset (Johanson et al., 2001). The discipline of accountancy does not regard human resources as a firm’s tangible asset. The salaries paid to manpower are regarded as expenses, and are recorded accordingly. From the managerial vantage point, however, workforce is perceived as precious resources. The accounting profession must consider such items as intangible capital. There is a very few number of intangible objects within financial accounting context, which appear in the balance sheet. Human resources are excluded; the economic rationale behind this lies in the fact that human capital is awkward to trade and valuate (Leadbeater, 2000).

The framework of Roos et al. (1997) was amended by Petty and Guthrie (2000) to demonstrate how IC could be placed (see Figure 2.7.)



Source: Petty and Guthrie (2000)

Figure 2.7
IC- Strategy and Management

Drawing from the IC literature, Petty and Guthrie (2000) asserted that there is a lack of widely acknowledged theoretical framework towards fully comprehending it. However, there are some resemblances which can be specified from the different frameworks (Van der Meer-Kooistra and Zijtstra, 2001). The following items are widely included in all these frameworks: knowledge and experience embedded in manpower, in both tacit and explicit shape, internal organizational processes, procedures, administrative structure, innovativeness and technology, corporate networks and associations with outside parties such as customers, suppliers, and alliances. Relying on some works (among others, Stewart, 1991; Brooking, 1996; Roos et al. 1997; Bontis, 1998), Bontis et al. (2000) have provided a comparison among various IC conceptualizations. Table 2.2 summarizes the findings, in addition to Edvinson and Malone (1997) classification which was not included in that work.

Table 2.2 Comparison of the Most Seminal IC Conceptualizations

Stewart (1991) (USA)	Brooking (1996) (UK)	Roos (1997) (UK)	Bontis (1998) (Canada)	Edvinsson and Malone (1997) (Sweden)
Human capital Employees are organisation's most important asset	*Human-centred assets* Skills, abilities and expertise, problem-solving abilities and leadership	*Human capital* Competence, attitude, and intellectual agility	*Human capital* Individual level of knowledge that each employee possesses	*Human capital* Individuals' capabilities, skill, and experience of employees and managers
Structural capital Knowledge embedded in information technology	*Infrastructure assets* All the technologies, processes and methodologies that enable company to function	*Organisational capital* All organisational, innovation, processes, intellectual property, and cultural assets	*Structural capital* Non-human assets or organisational capabilities used to meet market requirements	*Structural capital* The embodiment, empowerment, supportive infrastructure
Structural capital All patents, plans, and trademarks	*Intellectual property* Know-how, trademarks and patents	*Renewal and development capital* New patents and training efforts	*Intellectual property* Unlike IC, IP is a protected asset and has legal definition	*Structural capital* Patents, trademarks and copyrights
Customer capital Market information used to capture and retain customers	*Market assets* Brands, customers, customer loyalty and distribution channels	*Relational capital* Relationships which include internal and external stakeholders	*Relational capital* Customer capital is only one feature of knowledge embedded in organisational relationships	*Customer capital* Customer relationship and customer loyalty

Source: Bontis *et al.* (2000), Edvinsson and Malone (1997)

2.4 Gaps in Intellectual Capital Research

As discussed comprehensively in the IC conceptualizations in the previous section, several perspectives on IC have been developed by scholars during last two

decades. Table 2.3 specifically summarizes definitions, examples of operationalization, and related literature spanning the diverse fields.

Table 2.3 IC Definitions & operationalizations, and literature

Field	Definition	Operationalization				Literature
		Human	Structural	Social	Relational	
Economics	Knowledge, Intangible resources, Intellectual property	Quality of labor, Intelligence, Skills, Education level, Faculties supported by federal grant	Patents, Trade secrets, Trademarks, Copyrights, etc			Augier and Teece (2005), Lev (2001), Schankerman (1998), Zucker, Darby. and Brewer (1998)
Strategy/ Management/ Human Resources	Knowledge, Intelligence of individuals, Technology, Brand image, Management skills, Ability to utilize its knowledge resources	Skills at employee, Knowledge worker Turnover rate, Experience, Education, Experience	Intellectual property, Trade secrets, Copyrights, Database, Regulatory routines, Process manuals, Information system	Corporate culture, Network ties, Shared codes, Trust, Norms, Obligations, Identification	Consumer trust, Relationship with stakeholders, Strategic alliance	Edvinsson and Sullivan, (1996), Eisenhardt and Martin (2000), Hall (1993), Hudson (1993), Lane and Lubatkin (1998), Nahapiet and Ghoshal (1998), Stewart (1997), Subramaniam and Youndt, (2005)

Table 2.3 IC Definitions & operationalizations, and literature (continued)

	Definition	Operationalization				Literature
		Human	Structural	Social	Relational	
Marketing	Customer capital, Strategic-marketing capabilities, Functional-marketing capabilities, Operational capabilities	Creative skills, Negotiating skills of sales force, Know-how	Market information, Market sensing procedures, New product development procedures, Packaging design, Implementing promotion, Customer relationship management	Shared mental model, Trust, Personal interaction	Customer relationships, Customer satisfaction, Customer loyalty, Retention rate, Brand equity, Price tolerance, Relationship with external stakeholders, Strategic partners	Brooking (1997), Fernström (2005), Stewart (1997), Srivastava, Fahey, and Christensen (2001) Madhavan and Grover (1998)
Information System	Knowledge, Technology	Individual knowledge, Skills	Information system, Intranet, Database, Routines, Documents, Problem solution sets	Organizational culture, Team culture		Alavi and Leidner (2001), Griffith, Sawyer, and Neale (2003), Schultze and Leidner (2002)
Operations Management	Operating know-how	Skilled work force	Information system, State-of-art manufacturing processes		Supply chain integration , supply base	Menor et al. (2007) , Choi and Krause (2006)
Finance/ Accounting	Market assets, Human-centered assets, Intellectual property assets, Infrastructure assets, Brand equity	Employees' Knowledge, Expertise, Problem solving Capability, Creativity	Distributions channels, Licensing, Contracts, Patents, Technology, Processes, Methodologies		Brand equity, The number of premium customers	Cezair, (2008), Fincham and Roslender (2003), García-Meca and Martínez, (2007), Johnson and Kaplan (1987)

Source: Lee (2011)

A careful analysis of the literature reveals some remarkable facts. Firstly, a comprehensive review underlines this fact that a multidimensional view of IC must be taken into consideration to parsimoniously capture the concept. Such multidimensional perspective could be explained by two antecedents or so-called drivers of IC (adopted from one of the most famous IC conceptualizations suggested by Bontis, 1999), namely organizational culture and trust in addition to four dimensions: 1) human capital (HIC), which is defined as the collective knowledge of manpower such as experience, skills, and know-how; 2) structural capital (SIC), which refers to the particular knowledge possessed by an organization including information system, processes, and data; 3) social capital (SOIC), which can be described as the knowledge stem from informal interactions among the organizational members; and (4) relational capital (RIC), which represents the knowledge embedded in relationships with external parties such as customers, suppliers, and so forth. The aforesaid IC elements highlights the fact that there are distinctive knowledge-based assets which organizations could accumulate and exploit via human resources, structures, cultures and external partners (Berry, 2004; Stewart & Ruckdeschel, 1998; Subramaniam & Youndt, 2005).

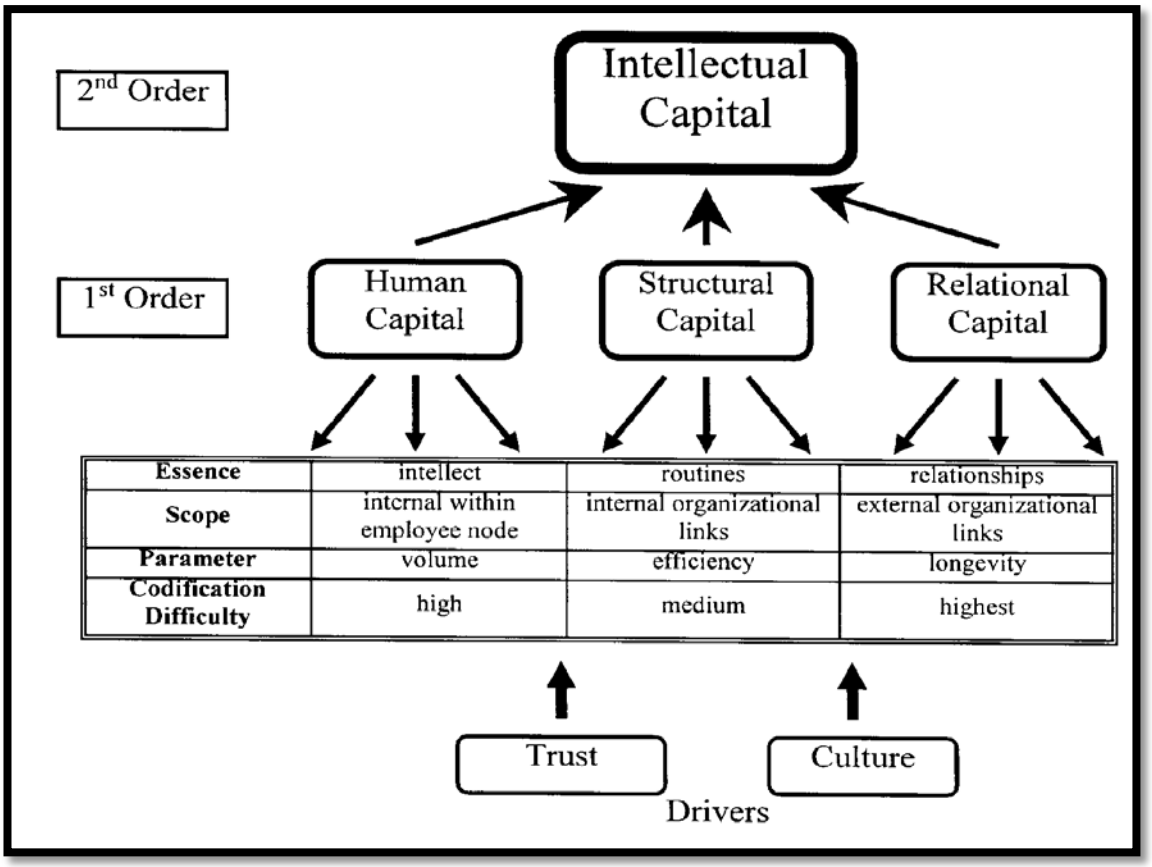
Secondly, there is a varied range of frequency which each of the components of IC is taken into consideration. HIC and SIC are considered most commonly, whereas SOIC and RIC are addressed to a lesser extent in the literature. Majority of the disciplines have concentrated on aspects of highest interest of their own. For instance, the area of accounting and finance has mainly focused on measurable resources merely, whereas overlooking the factor of social capital. The marketing major has primarily addressed customer relationships as the most significant intangible resources to gain profit. Information system area has devoted further

consideration to structural capital regarding the forms of IT system in order to support knowledge management. Integrated with the first point, this finding indicates the necessity of incorporating all the specific arguments from each discipline. Otherwise, the incoherent and sporadic disputes on IC would fail to provide an exhaustive and real insight to practitioners concerning how to detect and leverage critical knowledge-based assets of an organization (Marr, 2012). Recently, there are some empirical researches which carry a more precise view to the analysis of IC by acknowledging the multidimensional perspective (Menor et al., 2007; Subramaniam & Youndt, 2005; Yusoff et al., 2003). However, the investigated concepts are delineated and measured rather generally so that more comprehensive argument regarding how to manage a variety of intellectual resources becomes complicated.

2.5 Intellectual Capital Components; a Multidimensional View

In order to satisfy the desire for exploring a multidimensional view of IC, this study largely borrows the conceptualization introduced by Bontis (1999). In his model, two antecedent constructs, i.e. trust and culture, play a leading role as two supporting drivers behind the other Intellectual Capital dimensions. According to Bontis, the phenomenon of IC could be fallen into three components. As can be seen in Figure 2.8, each is illustrated based on its essence, scope, parameter and codification difficulty. Moreover, Bontis refers to the role of two drivers, namely ‘trust’ and ‘culture’ which can be considered for their influence on IC development. More recently, there are some other scholars in the context of IC which advocate the absolute necessity for establishing a framework with regard to the antecedent conditions which are essential for the efficient intellectual capital development (Bratianu et al., 2011; Isaac et al., 2009; O'Brien et al., 2010).

In addition to two aforementioned antecedent constructs, three general components of IC (Human Capital, Structural Capital, and Relational Capital) are supplemented by the fourth dimension i.e. Social Capital in order to address IC from multidimensional view as discussed in the previous section. The following subsections explain the antecedent variables and the four components of IC.



Essence	intellect	routines	relationships
Scope	internal within employee node	internal organizational links	external organizational links
Parameter	volume	efficiency	longevity
Codification Difficulty	high	medium	highest

Source: Bontis (1999)

Figure 2.8
IC conceptualization (Bontis, 1999)

2.5.1 Organizational Culture

Culture is the glue that holds together the organization. It evolves over time, from the deep knowledge of the firm's inner capacities, vision, traditions and values (Cabrita & Bontis, 2008). Cooperation and innovation are fostered within a culture

in which employees feel comfortable with failure. Brooking (1996) holds that corporate culture can be considered as an asset if the culture of a firm contributes to the accomplishment of the overall targets. Nahapiet and Ghoshal (1998) pointed out that culture is a driver of social capital and context. Itami and Roehl (1991) argued that corporate culture provides every individual inside a company a common and distinctive way in order to transmit and process the information. Culture "defines a common way of seeing things, sets the decision-making pattern, and establishes the value system" (Itami & Roehl 1991, p. 23). Corporate culture, organizational values, and management philosophies are the examples which classified under the culture assets. Culture assets furnish organization with a shared framework in order to shed light on the events for better interpretation; a framework which support people to function either as an autonomous entity or as a team to meet the organization's goals.

Peters and Waterman were among the most convincing proponents in advocating the crucial significance of corporate culture in gaining supremacy and excellence. They came to this conclusion via observation of their most successful company, "The excellent companies are marked by very strong cultures, so strong that you either buy into their norms or get out. There's no halfway house for most people in the excellent companies" (Peters & Waterman, 1982, p.77). A robust corporate culture is a system of core values, traditions, symbols, rituals, and informal rules that dictates what manpower should adhere to. Organizations that create their character via the expansion of values, heroes, elucidating rites and rituals, and acknowledging the cultural network will always have an ace up their respective sleeves. These organizations are not only limited to products or generation of profits, but also possess something that they can pass along to their employees (Bratianu et al., 2011).

Competing Values Model was originally suggested by Quinn and Rohrbaugh (1983). The purpose was to analyze the phenomena associated with various organizations, including culture, via the application of that framework (Deshpandé et al., 1993; Quinn & McGrath, 1985; Zammuto & Krakower, 1991). The competing values model encompasses two sets of competing values aligned with two axes: (i) the control/flexibility orientation, which embodies the preferences vis-à-vis structure, stability, and change, and (ii) the people/organizational orientation representing the differences in the context of an organizational focus. Four quadrants that embody four kinds of culture (i.e. rational, hierarchical, developmental, and group) are arisen out of these two axes (Quinn, 1988; Quinn & Kimberly, 1984). These four cultural types are ideals, due to the fact that it is most unlikely that a company will stick to one culture. Alternatively, each company tends to glorify its unique culture that is usually made up of combined values (Quinn & Kimberly, 1984). ‘‘Real organizations do not fall neatly into one or the other of these four models. In fact, the models do not contain organizations; organizations contain the models, all of them. In every organization all four models exist’’ (Quinn, 1988, p. 42). Accordingly, the difference among cultural types that are related to control and flexibility values are not split dichotomously; it is instead the extremes of the control/flexibility continuum (Henri, 2006b).

Concerning the conceptualization of organizational culture, this research focuses upon the control/flexibility dilemma, as it is related to the essence of management control systems, forming the core of ongoing debates with respect to management accounting. According to Quinn (1988), the rational and hierarchical types shape the value of control, whereas the expansion and group kinds represent flexibility. Control values are representative of predictability, stability, formality,

rigidity and conformity. This simply means that rational culture leans toward efficiency and profit. Planning, productivity and goal clarity seems to form the main focus in this work. Hierarchical culture is the personification of bureaucracy and stability. Besides, it puts value on enforced roles, rules and regulations. Overall, cultural types related to control values has an iron fist over control of operations, highly structured channels of communication, and restricted flows of information (Burns & Stalker, 1961). In contrast, flexibility values are representative of spontaneity, change, openness, adaptability and responsiveness. In other words, developmental culture shares this emphasis on adaptability and readiness to achieve growth, innovation, and creativity. Group culture sees cohesion, teamwork, and morale as methods of initiating/enhancing development, empowerment, and commitment of human resources. Overall, cultural types that are linked to flexibility values foster loose and informal controls, open and lateral channels of communication, and free flow of information throughout an organization (Burns & Stalker, 1961).

2.5.2 Trust

An organization's ability to develop relationships based on mutual trust is increasingly viewed as a cornerstone of competitive advantage (Barney & Hansen 1994, Lane 1998, Sako 1998). Organizations that possess an internal atmosphere of trust enjoy unprecedented advantages in their respective dealings (Shockley-Zalabak, Ellis, & Winograd, 2000), which can translate into cooperative relationships with external partners (Dyer & Singh, 1998; Zaheer, McEvily, & Perrone, 1998). Trust is an especially important commodity for global firms, due to uncertainty and risks being enhanced, and where cultures, values and goals might wildly differ from one's own (Lane & Bachmann, 1998). According to Rousseau,

Sitkin, Burt, and Camerer (1998), trust is a pivotal concept to organizational life. As Rolland and Chauvel (2000) pointed out, trust is an important prerequisite to knowledge sharing. Trust can be regarded as a basic building block, and is integrated into a majority of relationship models. Almost all definition of trust indicates the notion where a partner in a relationship would undertake an action that is deemed to be in the best interest of their respective partners. Listed below are some of the most commonly cited definitions of trust in the literature:

1. A willingness to rely on an exchange partner in whom one has confidence (Moorman et al., 1993).

2. One party believes that its needs will be fulfilled in the future by actions taken by the other party (Anderson & Weitz, 1992).

3. A party's expectation that another party desires coordination, will fulfill obligations and will pull its weight in the relationship (Dwyer, Schurr, & Oh, 1987).

4. The belief that a party's word or promise is reliable and a party will fulfill his/her obligations in an exchange relationship (Schurr & Ozanne, 1985).

For the purpose of this research, trust is operationalized based on the work of Barney and Hansen (1994), arguing that trust is a crucial factor in either inter-or intra-organizational cooperation. Trust is regarded as the level at which a company's employees orient their trust towards a partner organization (Zaheer et al., 1998, p. 142). Such a trust could improve corporate associations in various contexts, among others, firm/client (Moorman et al., 1992, 1993), marketing channels (Andaleeb, 1996; Kumar, 1996), joint ventures (Inkpen & Currall, 1998),

and international cooperative alliances (Johnson, Cullen, Sakano, & Takenouchi, 1996). These type of trust would promote the formulation of collective strategies (Astley & Fombrun, 1983) and coordinate of economic activities, foster exchange of information and inter-organizational learning (Hamel, 1991), alleviate conflict and the costs of negotiation between partners (Zaheer et al., 1998), augments system stability, and facilitate organizational changes (Sydow, 1998). Moreover, a company's climate is regarded as an atmosphere of trust. It refers to the people's positive expectations concerning the intention and behaviors of various individuals within an organization according to organizational roles, relationships, experiences, and interdependencies (Shockley-Zalabak et al., 2000). According to Shockley-Zalabak et al. (2000), companies which enjoy such trust to a greater extent would experience more success, be adaptive and innovative compared to companies that possess lower levels of trust, or those suffering from pervasive distrust. In this context, trust contributes towards teamwork, leadership, goal setting, and performance evaluation (Jones & George, 1998; Mayer et al., 1995; McAllister, 1995). It also augments human resources satisfaction, as well as commitment to an organization (Flaherty & Pappas, 2000).

2.5.3 Human Capital

Human capital represents the foremost component of intellectual capital, and is the most valuable source of sustainable competitive advantage (Nonaka & Takeuchi, 1996; Seleim et al., 2004). Generally, intellectual capital is regarded as an individual stock of knowledge that is entrenched in an organization's collaborative capability that will mine the best solutions from individual manpower (Bontis, 1999, 2001). Similarly, Edvinsson and Malone (1997) characterized human capital as being representative of the sum of workers' skills, experiences,

capabilities, and tacit knowledge. According to Davenport and Prusak (1998), "human capital includes the intangible resources of abilities, effort, and time that workers bring to invest in their work" (Davenport & Prusak, 1998, p. 49). The link between human capital and different outcome variables are entrenched in several theories, such as the economic human capital theory (Ducharme, 1998; Schultz, 1961), organizational learning (Bontis, Crossan, & Hulland, 2002), the resource-based view of the firm (Barney, 1991), and more recently, the knowledge-based view of the organization (e.g. Spender, 1996; Grant, 1996). As stated by Hudson (1996), human capital can be defined as an integration of four factors from an individual aspect, which includes genetic inheritances, education, experience, and attitudes about life and businesses. In fact, a macroeconomic approach regards human capital as driving national economic activities, competitiveness, and affluence (OECD, 1996). According to Bontis (1998), human capital is deemed as a well of innovation and strategic renewals. However, the other two dimensions of intellectual capital must be concerned. That is, in order to add more value, human capital must be amalgamated with relational and structural factors of a firm.

Factors such as individual's knowledge, competence, experience, and values, which are classified under human capital, cannot be constantly resided in an organization. As Ulrich (1998) noted, elements like individual's competency and commitment are capable of influencing and determining the other satisfactory outcomes such as customer loyalty, productivity and job performance. Conversely, some researchers (Becker, Billings, Eveleth, & Gilbert, 1996) placed more emphasize on elements such as commitment to supervisors' targets and values – for instance, by leadership, socialization and team building – instead of commitment to organizations. In other words, they believed that these factors are more capable of affecting the ultimate organizational performance in comparison with those related

to the organization's commitment. According to Bontis and Fitz-Enz (2002), there is a proportional link between commitment and organizational performance. They observed that, the general individual sentiment which is viewed as a function of employee satisfaction, commitment and motivation in a company are significantly able to affect the creation and development of knowledge, retention of skilled manpower and eventually, organizational performance. Accordingly, organizations are supposed to make every endeavor to employ capable and skilled manpower, direct superior intellect and develop their knowledge towards innovation and productivity via integration intellectual capital into customer value by collaboration (Chauhan & Bontis, 2004). As Stovel and Bontis (2002) argued, improvement in worker training can bring about better productivity and improved creativity which in turn lead to customer satisfaction and loyalty. According to Henderson and Cockburn (1994), increased innovation, productivity and speed-to-market are all positive outcomes of teamwork in firms. Hence, a positive correlation can be presumed between knowledge transfer and motivation. In this respect, Osterloh and Frey (2000) stated that, managing motivation, which includes balancing intrinsic and extrinsic motivation, can be regarded as a primary and hard-to-imitate factor of competitive advantage. Nevertheless, the process of knowledge transfer and development is deemed as a voluntary practice and often relying on the managers leaning towards it.

2.5.4 Structural Capital

Structural capital is an important strategic resource which encompasses non-human assets, such as information system, routines, procedures, and databases (Cabrita & Bontis, 2008). They posit that structural capital holds an organization together due to its capability in developing tools to retain, package and share

knowledge throughout the value chain. According Joshi et al. (2010), structural capital is seen as developed knowledge via an organization, and is inseparable from the firm. It can involve organizational structures, procedures, routines, systems, hardware, databases, and organizational cultures. Other elements exist, such as inventions, processes, copyright, patents, technologies, and system, which can classify under structural capital. Although structural capital is able to improve employee capability, it should consider as a separate feature from personnel on levels of individuals. As Sveiby (1997, p. 10) noted, structural capital falls into "patents, concepts, models and computer and administrative systems". According to Stewart (2000), structural capital could build a platform which enables employees to take pace towards innovation continuously within an organization. He also argued that, an appropriate structural capital would creates a supportive environment for quick information dissemination, collective knowledge development, shortened lead times and more creative individuals.

2.5.5 Relational Capital

Relational capital consists of all kinds of the interrelationship with outside parties or partners, such as customers, suppliers, competitors, industry associations, and other stakeholders that could influence the entity's business. Bontis (1999) emphasizes the significance of any knowledge flows stem from exterior sources to inside and vice-versa. So, he developed the construct labeled as client capital which was embraced all the kinds of exterior interrelations such as supplier, business associations and joint-venture. Bontis also noted that relational capital is assessed as "function of longevity and defends that its conceptualization emerges from the market orientation" (Kohli & Jaworski, 1990; Narver & Slater, 1990). According to Joshi et al. (2010), firms are capable of reaping more benefits whenever they

conserve stocks of relational resources, such as customer loyalty, customer satisfaction, strong brand image, goodwill, power to negotiate, strategic alliances, coalitions. It is imperative that not only organizations are supposed to make a concerted effort to create relational capital; they should help to perpetuate them. Sveiby (1997, p. 10) described relational capital as “relationships with customers and suppliers”.

2.5.6 Social Capital

Social capital is the sum of the actual and potential knowledge that are embedded within the networks of mutual acquaintance and recognition among employees (Nahapiet & Ghoshal, 1998; Subramaniam & Youndt, 2005). The social network develops over time through informal interactions and provides the basis for trust and cooperation in an organization (Granovetter, 1985). It is important to differentiate between social capital and structural capital as the latter includes formal procedures or managerial routines for gathering and storing individual knowledge. In contrast, in the case of social capital, informal and flexible interactions among organizational members could treat as another procedure to generate and share knowledge. Social capital can serve as a facilitator in transmitting manpower’s uncodifiable knowledge, while structural capital is not capable of transferring organizational members’ tacit knowledge to a firm’s repository completely. According to Stewart (1997), some kinds of the tacit knowledge disseminate just in the case that individuals meet, talk, and interact. Accordingly, companies have to form a social activity to promote learning, in which tacit knowledge of people is talked and disseminated for more effective utilization in the future (Ehin, 2000). This social activity seems to have a propensity to appear over time and develops into corporate cultures, norms, and established

patterns of behavior which are not readily affected by manpower mobility (Fiol & Lyles, 1985; Putnam, 1995). Particular cases encompass collaboration (Menor et al., 2007; Subramaniam & Youndt, 2005), trust (Fukuyama, 1995; Lane, Salk, & Lyles, 2001; Putnam, 1995), friendship (Richardson, 1986), entrepreneurial culture (Kang & Snell, 2009), mutuality (Ehin, 2000), obligations (Granovetter, 1985), etc. As presented in table 2.3 before, social capital has received somehow scant attention in the context of IC literature with the exception of strategy/management, marketing, and information system majors.

In conclusion, for the purpose of this study, the conceptualization of IC relies heavily on Bontis (1998). Human capital (HIC) captures knowledge, professional skills and experiences, and creativity of employees while structural capital (SIC) represents organizational mechanisms and structures that props employees in their search for optimum intellectual performance, consisting of innovation (intellectual assets such as patents) and process capital (organizational procedures and processes). Relational intellectual capital (RIC) deals with the knowledge of market channels, customer and supplier relationships, and governmental or industry networks. With respect to social capital, the current study adopts the definition of social capital suggested by Nahapiet and Ghoshal (1998, p. 243), which states “the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit”. Overall, it can be argued that IC is indicative of the possession of knowledge and experience, professional knowledge and skill, good relationships, and technological capacities; the utilization of which will almost always result in a competitive advantage for the user (CIMA, 2001).

2.6 Management Control System (MCS)

The MCS literature provides numerous definitions of what constitutes a management control system. An often cited definition of management control is provided by Anthony (1965). Management control is "the process by which managers ensure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" (as cited in Langfield-Smith, 1997, p. 208). This conceptualization structures the management control process in a hierarchical fashion between the strategy planning process and the process of operational control. Establishing goals and objectives is in the realm of strategic planning. The purview of operational control is ensuring that immediate day-to-day tasks are carried out. Management control is the transmission mechanism that links strategy and operations so that day-to-day affairs are carried out in a manner consistent with organizational objectives (Birnberg, 1998).

Otley and colleagues have argued that an unintended consequence of Anthony's work was that MCS development, at least initially, was unnecessarily restricted to the accounting function (Otley, Broadbent, & Berry, 1995). The definition provided by Horngren, Foster, Datar, Harris, and Curry (1997) is illustrative of this perspective. "A management control system is a means of gathering data to aid and co-ordinate the process of making planning and control decisions throughout the organization" (as cited in Rotch, 1993, p. 192). Other researchers (Flamholtz, Das, & Tsui, 1985; Ouchi, 1979) have focused on the behavioral dimension of management control. From this perspective, MCS is seen as a mechanism influencing behavior of individuals and groups in the organization. MCS is a means for gaining the cooperation of individuals and groups in the organization and directing their efforts to the furthering of organizational goals. A

third perspective focuses on the impact of organizational structure on management control. As Atkinson et al stated:

"Organizational structure can be defined broadly as the ways in which organizations bundle (organize) resources to achieve some end. Management accounting can then be viewed as the information support system that best facilitates communication, motivation and performance evaluation within a variety of organizational structures (1997, p. 88)."

This researcher takes the position that these conceptualizations should not be seen as competing definitions, but as dimensions of a more comprehensive, interrelated process. This view of management control was developed by Rotch (1993), Brickley, Smith, Zimmerman, Zhang, and Wang (2001), and Zimmerman (1995). Rotch perceived management control as an interrelated system of three elements: performance measurement, motivation, and organization structure. Similarly, Brickley et al. and Zimmerman conceived of management control as a three-dimensional process of assigning decision making responsibility within the organization (i.e., the organizational structure), and then developing performance evaluation and reward systems so that incentives are created to promote decision making that is consistent with organizational goals.

The study of MCS has been informed by the theoretical perspectives of organization behavior and psychology, economics, and contingency theory. Theories in organizational behavior and psychology have focused primarily on how control system attributes can affect employee perceptions, attitudes and performance. The predominant topics addressed by this research stream are budgeting, performance measurement, and incentives. Agency theory is the dominant economic approach to the study of MCS (Shields, 1997). The focus of this research stream is on the use of control systems to align the incentives of the

agent to those of the principal. The management control issue receiving the most scrutiny in this literature is employee incentive schemes. Performance measurement, transfer pricing and other control and accounting issues have also been researched. Because these issues are commonly investigated through mathematical models, researchers in this area typically focus on a limited number of abstractly-defined management control elements. Consequently, their contribution to knowledge in the area of management control is necessarily fragmentary (Speklé, 2001). In addition, a considerable body of contingency-based MCS research has developed over the past twenty years (Chenhall, 2003) and has evolved into a prominent perspective in the study of MCS (Chapman, 1997; Dent, 1990). This theoretical perspective has formed the basis for a large number of studies researching a wide range of contextual variables including environmental uncertainty, technology, organization structure, and strategy.

With more emphasize on current control mechanism, companies build multiple dimensions MCS to inspect the executive ability of financial and non-financial field (for example, internal control system or Kaplan & Norton's BSC, etc.). In effect, the essence of management control systems (MCS) is to manage the tension between creative innovation and predictable goal achievement, and to balance the basic organizational dilemma between control and flexibility (Simons, 1994b). Traditionally, MCS was considered to be formal control and feedback systems used to monitor organizational outcomes and correct deviations from preset standards of performance (Anthony, 1965; Hofstede, 1978). Now, the role of MCS to foster flexibility and support organizational change, innovation, and organizational learning is also recognized (Atkinson, Waterhouse, & Wells, 1997; Kloot, 1997; Simons, 1990).

Based on Simons (1994a) and Marginson (2002) clustered MCS into three groups where one of them is performance measurement system. The next section discusses specifically the performance measurement system which represents one of the key variables in the current study. As stated earlier, this research aims to examine the associations between firms' intellectual capital and performance measurement systems. Specifically, following the Henri's (2006b) study, two features or aspects of PMS are addressed simultaneously: first, diversity of measurement (i.e. wide range of multiple performance measures) is considered. Second, PMS use which is operationalized as the balanced use of PMS diagnostically and interactively is addressed. These PMS attributes will be clarified more precisely in the next section. To date, the majority of empirical research places more emphasis on subjects that are somehow related to diversity of measurement, while neglecting to focus on the overall usage of PMS. Measurement diversity is imperative, as it renders the cause-effect link to be obvious, and will also encourage managers to avoid suboptimizing via focusing improvement on one measure, while neglecting other measures (Hoque & James, 2000). However, it is quite clear that there is currently not a single theory or agreement regarding factors of context that effects the utilization of PMS (Ittner & Larcker, 2001).

2.7 Performance Measurement System (PMS)

The performance of all critical success factors should be captured and quantified by organizations. Comparing the differences between the results of the formulated strategy with real consequences of executed strategy is regarded as measuring performances. In this respect, Simons (2000) posited that measuring performance include tracking the successful execution of business strategy via

comparing actual results against strategic goals and objectives. In this context, Neely (1998) agrees with the practice of quantifying past action. As a matter of fact, the very definition of strategy is a pattern of resource allocation, allowing an organization to monitor and enhance performance which in turn resulted in a 'fit' between organizations' practices. As Porter (1980) asserted, in order to evaluate strategies, firms should measure the performance since performance is outcome of all organizational procedures and operations. According to Atkinson et al. (1995), performance measurement is regarded as the most critical, misunderstood, and complex function in the context of management accounting.

Otley (2001) notes that firms determine their performance based on the following perspectives: effectiveness (delivering desired outputs, and even outcomes), efficiency (using as few inputs as possible to obtain these outputs), and economy (buying inputs as cheaply as possible). These factors seem to imply that point of view of performances is made up of production of outputs, transformation of inputs, and the purchasing of inputs. Besides, Simons et al. (2000) agreed that the performance of profits is gauged with regards to effectiveness and efficiency. Sink (1985) developed an approach which reflects a complicated association among the following seven performance principle (as cited in Rolstadas, 1998, p. 990):

1. Effectiveness: includes performing the right things, at the right time, with the right quality, etc.; described as real output or projected output.

2. Efficiency: this can be categorized as an input and transformation process question that is perceived as a comparison among resources expected to be consumed against resources actually consumed.

3. Quality: this considered as much broader construct. The way of quantifying such perspective includes the connecting it to customers, suppliers and providers, with regard to quality management

4. Productivity: the traditional ratio of output/input.

5. Quality of work life: a basic contribution to a well-performing system.

6. Innovation: a critical factor for maintaining and enhancing performance.

7. Profitability / budgetability: refers to the ultimate aim for any organization.

The set of performance measures should be appropriate for supporting performance objectives. Simons et al. (2000) pointed out that the measure should meet three requirements (1) It must be aligned with strategy. That is, appropriate indicators enable manpower to perceive and comprehend planned corporate strategy. (2) It should capable of measuring effectively. The measures must be characterized as being objective, comprehensive and responsive. (3) It must be linked to value. Output measures should provide the most accurate value. The measures of input process are regarded as accurate only when the cause-and-effect link is passed through the managers.

Parker (2000) rationalized factors of measuring performances such as recognizing success or failure, gauging customer satisfactions, propping up process understanding, i.e. what is already known and what is to be known, zooming in onto the problems, being the source of information for the purpose of propping up decisions, and confirming the success of real results. Meanwhile, Neely (1998) also offered four rationales for concentrating upon performance: ‘measurement check position, communicate position, confirm priorities, and compel progress’. Amaratunga, Baldry, and Sarshar (2001) posited that the measurement of

performances is seen as a conduit for observing and upholding organizational control, which is in turn a process that guides an organization in its pursuit of strategies leading to the realization of goals and objectives. An effective PMS embodies key performance indicators/measures (performance) that looks to each practice and entity from the prism of a customer; analyzing each practice by means of customer validated measures of performance; taking into account all aspects of practice performance that influences customers and, are thus comprehensive, and gives feedback to support employees diagnose issues and seize opportunities for enhancement (Atkinson et al., 1995).

Performance measures fall into two broad categories: financial and non-financial measures. Financial measures are principally quantitative measures, while non-financial measures are regarded as qualitative indicators. These measures are intended to determine whether the implemented financial program and strategies result in maximizing profits (Simons et al., 2000). According to Usoff et al. (2002), there are three financial performance measure models which generally employ to capture firm performance: accounting-based measures, stock market-based measures, and hybrid measures. As Usoff et al. (2002) stated, these three models are archaic performance measures that were derived from costing and accounting systems. As an example, the following measures are regarded accounting-based measures which some of them will be explained briefly below: Return on Assets (ROA), Return on Equity (ROE), Return on Investment (ROI), Residual Income (RI), Discounted Cash Flow (DCF) and Economic Value Added (EVA). On the other hand, the central focus of non-financial measures is on intangible resources, such as key customers, internal processes, and learning and growth (Simons et al., 2000). According to Eccles (1991), established accounting systems include numbers

that are deemed to be incapable of supporting ventures into new technologies and markets required to successfully compete a global setting. PMS should be able to answer the following three questions:

1. What are the most significant measures of performance with respect to the corporate strategy?

2. How do these measures relate to one another?

3. What measures truly predict long-term financial success for the business?

Performance measurement system could play a prominent role in managing the business and its fundamental strategic resources through providing relevant and vital information for managers (Widener, 2006). The maxim that “if you can’t measure it, you can’t manage it” (Kaplan & Norton, 1996, p. 21) or put differently, “you can’t manage what you can’t measure” assumes that business performance would be positively influenced by the measurement of the organization’s fundamental critical success factors such as strategic capacities and assets. With the above discussion, the current study assumes that although the level of IC and organizational performance are associated directly and positively, the role of performance measurement system is able to intervene or mediate in that association. According to Widener (2006), once organizations acquire their strategic resources/capabilities, performance measurement system would be employed in order to assist in the capturing and managing such vital resources. Then, the providing useful feedback and information on that fundamental capital, which aimed at supporting entity in exploiting the strategic resource effectively, in turn leads to performance improvement. This implies that some of the advantages stem from the intellectual capital would influence firm performance indirectly through the emphasis put on the usage of PMS.

It was previously mentioned that two aspects of PMS are addressed in the current study. The first one is 'diversity of measurement' which covers a wide range of multiple performance measures. The second aspect refers to PMS use which is operationalized as the balanced use of PMS interactively and diagnostically. Both of which will be discussed in detail in the next section.

2.7.1 Diversity of Measurement

Measurement diversity, as a general construct, is associated with different dimensions: "drivers versus outcome measures, subjective versus objective measures, internal versus external measures, and financial versus non-financial measures" (Ittner, Larcker, & Meyer, 2003a; Kaplan & Norton, 1996). This research follows the work of Hoque and James (2000), Hoque and Adams (2008), Ittner, Larcker, and Randall (2003b), and Henri (2006b); measurement diversity reflects particularly the degree to which managers measure and use information concerning a wide range of financial and non-financial indicators. According to Henri (2006b), the diversity of measurement is representative of the multiplicity and variety of performance measures that could be classified as either financial performance or non-financial performance. Many researchers and practitioners have questioned conventional performance measures that are dependent upon financial indicators (Atkinson et al., 1997; Fisher, 1992; Kaplan & Norton, 1992, 1996). Despite their capability in reporting decisional outcomes in a comparable measurement unit, capturing cost of trade-offs between resources and the cost of spare capacities, and also their capability in assisting contractual associations and capital markets (Atkinson et al., 1997; Epstein & Manzoni, 1997), financial indicators are doubted due to several factors. In contrast to non-financial measures,

financial measures are increasingly regarded as relying on history and looking backwards; lacking a predictive capability in gauging future performances, being more favorable towards short-term prospects or reckless behaviors, low levels of actionability, lacking timely signals, being too general to guide managerial action, being more indicative of functions instead of cross-functional processes, and being incapable of guiding the appraising of intangible resources (Ittner & Larcker, 1998). Nevertheless, the connection between enhancement in non-financial measures and profits remains vague, and impossible to confirm. The utilization of non-financial indicators, in addition to financial measures, could also result in dysfunctional behavior where organizational members employ ‘‘gaming’’ in order to augment individual performance (Fisher, 1992).

Several techniques based on the integration of financial and non-financial data were proposed for increasing the relevance of internal information. For example, Dixon, Nanni, and Vollmann (1990) develop a balanced PMS through which costs-and-performance knowledge is obtained and used in the cycle of strategic management, while Lynch and Cross (1995) proposed the construction of a performance pyramid that links strategy and operations via the translation of strategic goals from the tip to the bottom, while measuring from the bottom to the tip. In a similar vein, Atkinson et al. (1997) constructed a stakeholder framework that integrates measurement for both primary and secondary goals of environmental and process stakeholders. Kaplan and Norton (1992, 1996) came up with a balanced scorecard (BSC) that includes an integrative approach, underlining strategy and vision over control. The model encompasses four perspectives, namely financial, customer, internal business process, and learning-and-growth perspectives. Such PMS framework is in tandem with recent firm movements: cross-functional

combination, customer–supplier associations, constant development, and group responsibility. In this research, the four perspectives of the BSC are adopted as a fundamental model with regard to its growing usage in companies as well as its adoption in recent empirical studies in the management accounting context (e.g., Hoque & James, 2000; Ittner et al., 2003a; Henri, 2006b; Jusoh & Parnell, 2008).

Nowadays, corporate social responsibility (CSR) has attracted many interests of many businesses. The performance measurement system of companies was enhanced to a triple bottom line (TBL) performance in a multi-dimensional setting from the traditional financial performance in the form of single dimension. Concerning the significance of investigating the topic of sustainability in performance evaluations, several scholars (Atkinson, 2000; Dias-Sardinha & Reijnders, 2005; Hsu, Hu, Chiou, & Chen, 2011) embarked on various frameworks in order to measure and manage sustainable performances. With respect to the properties of periodic and systematic system controls in strategic management of sustainability, balanced scorecard (BSC) were always used in the evaluation of the environmental and social performances of organizations (Bieker & Waxenberger, 2002; Dias-Sardinha & Reijnders, 2005; Epstein & Wisner, 2001; Figge, Hahn, Schaltegger, & Wagner, 2002; Johnson, 1998).

From the preceding discussion, for this particular study, it is therefore justifiable to supplement the existing the diverse performance measures including the four perspectives of BSC with some additional performance measures which are classified under the heading of social and environmental perspective (or so-called sustainability performance) as the fifth dimension. There are certain numbers that are always used by firms when selecting sustainability performance measures,

despite the fact that there is no general consensus on standard or guideline worldwide. Following Hoque and Adams (2008), sustainability performance covers: “natural resource conservatiosn and emission levels; other environmental activities and initiatives; aspects of employment; occupational health and safety; community relations; stakeholder involvement; and economical impacts of the organization other than financial measures that are used in the financial accounts” (Hoque & Adams, 2008, p. 18).

2.7.2 The Balanced Use of Interactive and Diagnostic PMS

In order to operationalize the balanced use of interactive and diagnostic PMS or put briefly the “balanced use of PMS”, this research relies upon a variety of categories of management and accounting for information systems. This part addresses these different classifications in summary for the purpose of highlighting their connections and common views. Simon, Guetzkow, Kozmetsky, and Tyndall (1954), in early classifications, grouped the use of accounting information based on three types, namely score card, problem solving, and attention directing. In the same vein, Burchell, Clubb, Hopwood, Hughes, and Nahapiet (1980) as well as Vandenbosch (1999) developed similar classifications. The early ones took into account the function of accounting practices as answering machine, learning machine, and ammunition machine, whereas the later ones categorized the utilization of management information system as score keeping, problem solving and attention-focusing. Nevertheless, both replaced a group that has to do with the justification of organizational actions: rationalization machine (Burchell et al., 1980) and legitimization (Vandenbosch, 1999).

Atkinson et al. (1997), drawing from the viewpoint of a stakeholder, described the contribution of performance measurement based on three functions i.e. coordination, monitoring, and diagnosis. The coordination between these factors is reflective of PMS in the context of directing and focusing a decision-makers attention to the primary and secondary targets of the company. The role of monitoring is linked to the measurement and reporting of the performance in realizing the need of the stakeholders. Finally, the diagnostic aspect is oriented towards the appraisal of the cause-and-effect links between process performance, organizational learning, and organizational performances. Simons (1990) introduced two aspects, namely diagnostic and interactive use of control systems. The former is representative of the formal feedback systems that are utilized to monitor predictable goal realizations, whereas the latter focuses attention and emphasizes dialogue throughout the company by disseminating signals from top managers.

Deriving from the aforementioned analysis, Henri (2006b) came up with four types of PMS broad application: monitoring, attention focusing, strategic decision-making and legitimization. In a nutshell, performance measures are utilized to provide feedback regarding expectations, all the while linking it with various stakeholders (monitoring role). Throughout the decision-making procedures, they act as facilitators (strategic decision making), substantiating decisions or actions (legitimization). Moreover, the top management utilizes performance measures to disseminate signals throughout the company (attention focusing). Following Henri (2006a), for the “the balanced use of PMS” construct, this study adopts the simultaneous utilization of diagnostic and interactive PMS. According to Henri (2006a), the joint usage of PMS results from a balanced use of PMS in a diagnostic

and interactive fashion is done in parallel. These three fashions i.e. diagnostic, interactive PMS use and the balanced use are presented separately in more detail below.

2.7.2.1 Diagnostic PMS Use

Answering the question, ‘‘How am I doing?’’ (Simon et al., 1954), monitoring represents a feedback system that is reliant on cybernetic logic where objectives are confirmed in advance, performance is evaluated, objectives and result compared, feedback provided, and eventually, amendments are made if deemed needed. The data collected is applied for the purpose of reporting and external disclosures. Fulfilling the role of diagnostic control (Simons, 1990) and answering machine (Burchell et al., 1980), PMS is invariably linked to the measurement and reporting of performances in the realization of the requirements set by stakeholders (Atkinson et al., 1997). Monitoring necessarily implies the more diagnostic use of PMS within a firm. According to Henri (2006a, p. 533), the diagnostic use of PMS embodies “the traditional feedback role as MCS are used on an exception basis to monitor and reward the achievement of pre-established goals”. Drawing from a conventional mechanistic perspective of control, a diagnostic PMS utilization grants inspiration, and paves the way for objectives attainment by rectifying deviations from a predetermined standard of performance. The diagnostic fashion is inclusive of the analysis of crucial performance variables that embraces elements supporting the attainment of intended strategy, and to control and manage the execution of preset strategies. There are two rationales behind its negative force. First, diagnostic use lays emphasis on deviations and negative variances. Second, the signal of the deviation which is arisen when results and targets are contrasted is reversed within the feedback signal in order to amend the procedure(s).

2.7.2.2 Interactive PMS Use

Designated signals that dealt with questions such as ‘‘what problems should we look into?’’ (Simon et al., 1954) are signals transmitted via executives, by means of performance measures, all over the firm. These signals are expressive of their perspective of the firm, key success factors, and salient uncertainties. According to Simons (1990), PMS acts as interactive control in order to promote organizational dialogue. It also acts as an ammunition machine (Burchell et al., 1980) that propagates specific positions, and is reflective of a particular conception of the organizational mission. The dispatched signals are indicative of primary and secondary goals, whereby organizational members must focus (Atkinson et al., 1997; Vandenbosch, 1999). Attention focusing necessarily implies the more diagnostic use of PMS within a firm. In contrast to diagnostic, the interactive utilization of PMS indicates a positive force, as MCS are deployed to enhance opportunity seeking and learning in an organization. Interactive usage leans towards focusing attentions. Dialogue is being encouraged in a firm via reflecting signals that are dispatched by high level managers. Moreover, it encourages the development of creative inspiration and ideas, and navigates the emergence of bottom–up via the emphasis on strategic uncertainties (i.e., contingencies threatening or invalidating underlying assumptions of current strategies). When MCSs are utilized in an interactive fashion, (i) the collected information is a recurring and significant agenda for high level management team; (ii) attention is promoted all over the company frequently and regularly; (iii) information are argued and interpreted among employees of various hierarchical levels; and (iv) frequent challenge and argument take place regarding facts, assumptions and plan of actions.

2.8.2.3 The Balanced Use of PMS

PMS uses diagnostically and interactively reflect two complementary and nested uses. They function concurrently and yet for dissimilar intentions. On the one hand, diagnostic fashion embodies a mechanistic control employed to track, evaluate and assist the accomplishment of predictable targets. On the other hand, interactive use represents an organic control system with the intension of facilitating the advent of communication procedure and the reciprocal adjustment of corporate members. In fact, a diagnostic use restricts the function of PMS to a measurement tool, whereas an interactive use develops its function to a strategic management tool (Kaplan & Norton, 2001). As Simons stated, diagnostic and interactive uses of MCS embody countervailing forces utilized with the intension of balancing the inherent organizational tension. According to De Haas and Kleingeld (1999), although diagnostic use of PMS is not perceived an end in itself, it can be considered as a lever essential to launch strategic dialogue and interactive use of PMS. In effect, diagnostic use signifies single- loop learning and serves as a necessary precondition for interactive use and double-loop process (Argyris & Schon, 1978). Hence, the use of PMS ranges from typically diagnostic to a compound of diagnostic and interactive.

The balanced use of PMS in a diagnostic and interactive style is needed for handling inherent organizational tensions (Henri, 2006a). According to Lewis (2000), such integration indicates conflicting but interconnected factors. In essence, tension refers to two phenomena in a dynamic association which contain either competition or complementarity (English, 2001). As Henri (2006a) argued, the simultaneous use of PMS in an interactive and diagnostic fashion would result in

dynamic tension which represents competition (positive versus negative feedback) and complementarity (focus on intended and emergent strategies). According to English (2001), the concept of dynamic tension is associated with other constructs such as conflict, paradox, dilemma, and contrast and therefore it is not considered new within the academic literature. For example, some scholars have investigated the paradox concerning the propensity to explore risk and innovation whereas at the same time carrying out a secure and incremental implementation (Bourgeois & Eisenhardt, 1988; Cameron, 1986). Other work scrutinized conflicts in the context of utilization and execution of control and cost systems (Barrett & Fraser, 1977; Chenhall, 2004). In fact, tension is not inevitably negative but alternatively it might carries positive effects for companies according to the conflict literature (De Dreu, 1997; Nicotera, 1995). Henry (2006a) studied the influence of the dynamic tension resulting from the joint use of PMS in a diagnostic and interactive fashion on capabilities leading to strategic choices.

2.8 Organizational Performance

Prior to addressing the various aspects of the organizational performance concept specifically, it is imperative to elaborate briefly at the outset of this section how organizational performance would be explained by IC through PMS as the main focus in the current research. As explained earlier, IC encourages value creation which in turn leads to superior performance in today's knowledge based economy (Marr et al., 2003). That is, the central premise of resource-based view assumes that the use of strategic resource helps firms maintain their competitive advantage (Barney, 1991). More importantly, organizations are not able to realize their benefits (organizational performance) if their strategic resources, mainly include IC and knowledge assets, are not managed appropriately (Coff, 1997;

Widenet, 2006). According to Simons et al. (2000), PMS is perceived as a powerful lever to support management of strategic resources. Relevant information in relation to those organization's underlying strategic assets and critical success factors are provided through PMS (Kaplan & Norton, 1996). In this respect, the adage "if you can't measure it, you can't manage it" (Kaplan & Norton, 1996 p. 21) underlines this fact that organizational performance would be positively affected through the measurement of the organization's fundamental critical success factors such as strategic assets and intellectual capital. This implies that some of the advantages stem from the intellectual capital may influence firm performance indirectly through the emphasis put on the usage of PMS. As Kaplan & Norton (2001b) asserted, intangible assets seldom have a direct and immediate effect on performance, instead they typically influence organizational outcomes via chains of cause-and effect relationships involving two or three intermediate stages. Hence, it is also worth investigating the mediating role of PMS in the relationship between IC and performance.

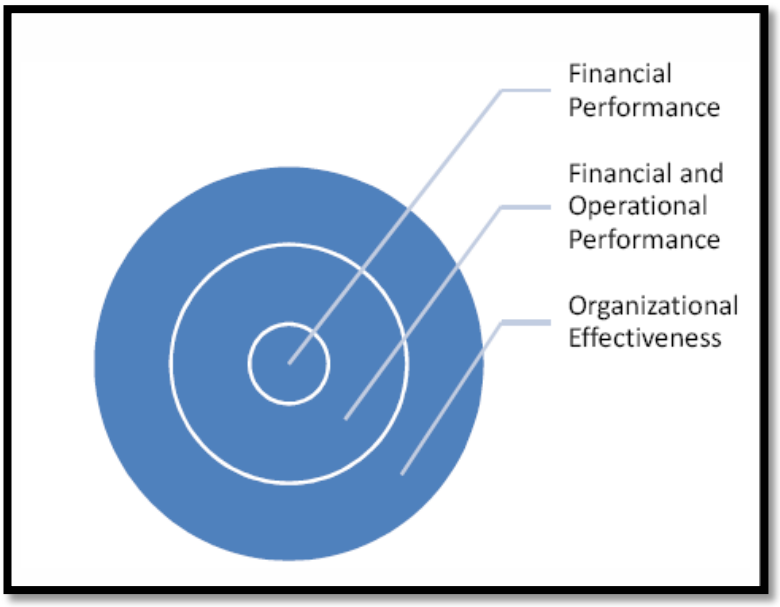
Organizational performance has been adopted frequently as the most central measure in appraising firms' function; yet, scholars generally devote scant attention to what performance is and how it is measured (Richard, Devinney, Yip, & Johnson, 2009). Scholars encounter several difficulties and challenges in order to evaluate organizational performance effectively. According to Devinney, Richard, Yip, and Johnson (2005), a thorough understanding the structure, scale, and scope of organizational performance is quite difficult which this can be attributable to multidimensional nature of organizational performance. Besides, other measures which the company employs internally and how they change management decisions and practices could potentially affect the associations among variables of interest

(such as intellectual capital in this case) and performance (Devinney et al., 2005). Furthermore, organizational performance differs over time and it is ambiguous which indicators differ in which manners (Devinney et al., 2005). Finally, there are some practical challenges and ambiguities regarding the type and nature of performance measures usage in terms of subjective versus objective measures or financial versus non-financial measures (Devinney et al., 2005). As Dess and Robinson (1984) argued, two central challenges should be dealt with in studies exploring organizational performance: (1) adoption of a conceptual framework through which organizational performance is defined and (2) finding the valid measures to operationalize organizational performance. These challenges are discussed in more detail below.

2.8.1 Conceptualization of Organizational Performance

In investigating the concept of organizational performance, it is imperative that organizational performance is well defined as well as distinguished clearly from other strongly-related concepts, such as organizational effectiveness. As demonstrated in Figure 2.9, the association between organizational performance and organizational effectiveness is illustrated (Venkatraman and Ramanujam, 1986). Venkatraman and Ramanujam (1986) treated financial performance (e.g. sales growth or profitability) as the narrowest concept of performance, while labeled non-financial performance (e.g. product quality, marketing effectiveness that all denote business performance) as the broader conception. Nevertheless, business performance still mainly concentrates on elements which result in the attainment of a company's financial targets.

According to Venkatraman & Ramanujam (1986), the construct of organizational effectiveness is applicable only when various and contradictory objectives regarding other stakeholders are incorporated. They advised scholars to place more emphasis on the measurement domain recognized through both financial and business performance (Venkatraman & Ramanujam, 1986). In consistent with Venkatraman and Ramanujam (1986), this study conceptualizes organizational performance in a broader notion whereby both financial and non-financial performance can be incorporated. Specifically, the former is operationalized as "financial performance" and the latter is labeled as "nonfinancial performance", to be in harmony with the terminology applied in the PMS literature.



Source: Venkatraman and Ramanujam (1986, p. 803)

Figure 2-9
Circumscribing the Domain of Business Performance

2.8.2 Operationalization of Organizational Performance

From the measurement aspect, there are three perspectives broadly employed for the purpose of operationalizing organizational performance as a criterion variable (Devinney et al., 2005). The first perspective is adopting a single measure which is supposed to intimately connect to organizational performance while the second one is deploying several various indicators but comparing them separately to the same independent variables. Finally, the third perspective, which is considered as the most common approach, is to adopt several various measures and aggregate them into a dependent variable (Devinney et al., 2005). Concerning the last perspective, Venkatraman and Ramanujam (1986) asserted that there are many operationalizations and multi-dimensionality even within the financial performance and business performance domain. Hence, they suggested that scholars must either "explicitly test the dimensionality of their conception of business performance" or apply "a priori classification which recognizes the dimensionality issue" (Combs, Crook and Shook, 2005 p. 807).

According to Combs, Crook, and Shook (2005), the recent scholars have not adequately advocated the last approach. In the endeavors of Combs et al. (2005) to recognize dimensionality of organizational performance, they figure out that operational performance and financial performance are different. In this respect, financial performance could fall into accounting returns, stock market, and growth measures. In addition, they found that operational performance is an antecedent to financial performance and it embraces several dimensions. Accordingly, they discourage researchers from adopting measures which integrate both operational and financial performance such as return on equity and earnings per share. The reason is that the numerator is derived from financial performance while the

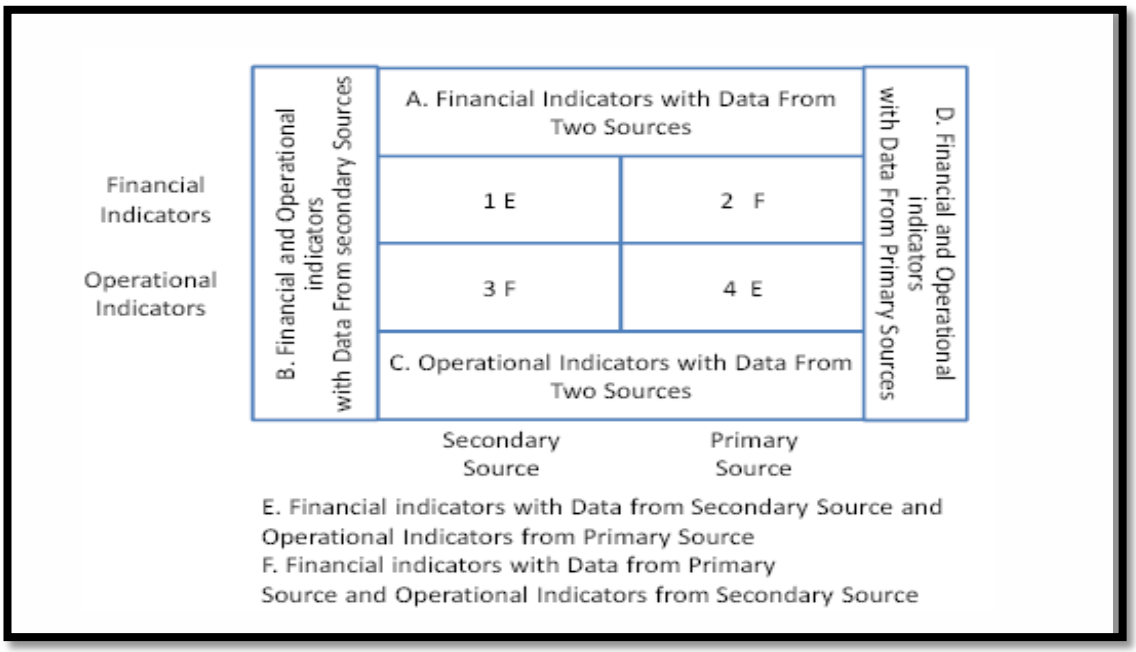
denominator is capital structure that somehow connects to operational performance (Combs et al., 2005). According to Richard et al. (2008), there is ample empirical evidence that confirms the relationship between financial performance measures and non-financial measures. Indeed, this assumption also underpins the concept of the strategy map or business model in the PMS literature.

There are various forms in the PM literature in relation to addressing and operationalization of organizational performance. For instance, Hoque and James (2000) captured organizational performance through assessing return on investment (ROI), margin on sales, capacity utilization, customer satisfaction, and product quality. Likewise, Evans (2004) examined the association among the types of performance measures in the Baldrige Criteria for Performance Excellence (citation) and three organizational performance measures, namely customer satisfaction, market share, and financial performance in comparison with competitors. Subsequently, Hoque (2004) utilized a validated questionnaire belongs to Govindarajan (1984) and measured 12 elements of organizational performance (i.e., operating profits, ROI, sales growth rate, market share, cash flow from operation, new product development, market development, R&D, cost reduction programs, personnel development, workplace relations and employee health and safety) over a three-year period. Similarly, Schiemann and Lingle (1999) assessed organizational performance from three-year ROI and CEOs' appraising of their company on three indicators: perceived as an industry leader over the past 3 years, reported to be financially ranked in the top third of their industry, and last major cultural or operational change judged to be very or moderately successful. There is a general consensus in the literature which tends towards combing the financial and non-financial measures to operationalize the organizational performance.

Besides the dimensionality concern, scholars need to take two other important research design issues into consideration when trying to capture organizational performance. The first relates to source of data either in terms of primary or secondary sources and the second concerned with types of measures which include objective and subjective measures.

2.8.3 Source of Data

Primary data, which is extracted directly from companies, versus secondary data, (obtained from publicly available records or databases) are the two main performance data sources (Venkatraman & Ramanujam, 1986). Venkatraman and Ramanujam (1986) introduced ten major perspectives which could be adopted for evaluating organizational performance. As demonstrated in Figure 2.10, there are four “within-cell” (numbered 1 through 4) and six “across-cell” (labeled A through F). Venkatraman and Ramanujam (1986) highlighted advantages, disadvantages and critical methodological issues when adopting each perspective. In this study, the both operational and financial performance data were collected directly from companies (perspective D). Venkatraman and Ramanujam (1986) recommend that scholars choosing this perspective need to take account of the following points (1) target respondents must be chosen in accordance with particular criteria (e.g., positions, functions, and so on); (2) assessing performance in relation to industry; (3) identify a priori dimensions of performance and empirically examine the dimensionality; and (4) applying multiple respondents for the purpose of facilitating the assessment of systematic bias and measurement error.



Source: Venkatraman and Ramanujam (1986, p. 805)

Figure 2.10
A Scheme for Measuring Organizational Performance

2.8.4 Type of Measures

Drawing upon the PM literature, there are four categories of measures with regards to the types of measure: Fully-Objective, Quasi-Objective, Fully-Subjective and Quasi-Subjective.

2.8.4.1 Fully-Objective and Quasi-Objective

Concerning Fully-objective indicators, information are gathered from operationally defined measures such as ROI, ROA, ROS, or market share relying upon an central premise that such measures embody precise theoretical notions of organizational performance and they are applicable across industries (Ketokivi & Schroeder, 2004). Fully-objective indicators are basically the accounting and financial market measures, which have been frequently used in the literature, gained from databases such as Compustat and PIMS (Richard et al., 2008).

According to Richard et al. (2008), the absolute performance information such as sale dollars, percentage of market share, and so forth could be extracted by self-report methods as well, in which case such measures are labeled as Quasi-objective measures. Nevertheless, they noted that the majority of the scholars generally consider such measures to be broadly comparable with the fully objective measures (Richard et al., 2008).

In either case, scholars report many issues when utilizing objective measures in survey study, particularly in a large-sample research. For instance, Dess and Robinson (1984) contend that objective information gained by survey studies might be vulnerable to measurement error due to the confidential nature of the data and various accounting routines among firms. Besides, Ketokivi and Schroeder (2004) point out that the same objective measure can be interpreted in a different ways across industries or even within industries. It is difficult to aggregate the objective measures due to implicit associations among them. Also, there are several organizational performance dimensions which cannot be directly observed inasmuch as they only exist in cognitive sense.

2.8.4.2 Fully-Subjective and Quasi-Subjective

As an alternative, operationally defined measures such as ROI or ROA could be gained directly from an organization in conceptual forms. That is, the measurement units are defined in relative terms to competitors or industry (Ketokivi & Schroeder, 2004). Scholars are generally oriented towards this perspective, thereby tackling the issue of low response rates when requesting respondents to directly provide the data (Ketokivi & Schroeder, 2004). In this case, the credibility

of performance data hinges upon the respondent's discretion; thus, Ketokivi and Schroeder (2004) labeled such data as Quasi-perceptual measures.

Fully-subjective measures ask supposedly knowledgeable informants about organizational performance, as opposed to fully-objective measure (Richard et al., 2008). In this perspective, performance measures are not connected with any operational definition and survey can direct informants to the items of performance directly, either individual or in aggregate forms with the intention of offering maximum flexibility (Richard et al., 2008). Using such type of measure can potentially undermine the credibility of data extracted. Ketokivi & Schroeder (2004) enumerate some potential issues of this perspective which are set as follows: (1) the truthfulness and bias of the respondents, (2) the different or inconsistent interpretation of measures' definitions (3) the anchor of scales such as "strongly agree" or "above industry average". Furthermore, fully subjective data usually encounter problems concerning cognitive biases. For example, respondents are generally oriented towards positive attitude toward themselves, interpret data in their favor, and take credit from unclear condition (Richard et al., 2008). Besides, the validity of the subjective measures is left on the quality of participant's recall of events and information of respondents (Richard et al., 2008).

However, several scholars note that issues regarding subjective measures may not be as consider as major concern. Firstly, Venkatraman and Ramanujam (1987) pointed out that informants of subjective measures are generally appointed from top management team those are considered as representatives of the company. Wall et al. (2004) further discuss that these well-informed informants generally rate and assess their own organizational performance relying on information extracted from

objective performance data. Secondly, as Wall et al. (2004) argued, there is empirical evidence confirming that subjective measures reflect robust construct validity, as well as moderate convergent validity and discriminant validity. Moreover, a meta-research demonstrates that the association between objective and subjective data holds irrespective of the measurement perspective: overall vs. composite or relative vs. absolute (Bommer et al., 1995 cited in Wall et al., 2004).

According to Richard et al. (2008), the correlation between subjective and objective measures is between 0.4 and 0.6, with one research showing the relationship as strong as 0.8. As Dess and Robinson (1984) reported, “subjective measures can be useful to operationalize organizational performance when accurate objective measures are unavailable and when the alternative is to remove the consideration of performance from the research design” (p. 271). Their observation indicates that by offering respondents with prior notice regarding multidimensionality of firm performance along with a subjective 'overall performance' item, participants have a propensity for providing answers in line with objective indicators (i.e., return on assets and growth in sales) either within or between each organization (Dess & Robinson, 1984). Likewise, Venkatraman and Ramanujam (1987) investigated convergence between relative performance of sales growth, net income growth, and ROI assembled from Business Week magazines and CEOs’ perceptions of firm performance in comparison with their main competitors. Through applying the MTMM-CFA analysis, they observed a high level of convergence between the two techniques. They commented that scholars must not infer that one is generally better than the other (Venkatraman & Ramanujam, 1987).

Ketokivi and Schroeder (2004), more recently, investigated the relationship between objective and subjective measures through addressing the use of multiple dimensions of performance and multiple respondents. Their MTMM-CFA examination findings indicate strong reliability and medium validity of the subjective measures; thus, they deduce that the use of subjective indicators is plausible (Ketokivi & Schroeder, 2004). Nevertheless, they refer to issues regarding single respondents who were heavily biased and bring about underestimation of the association between objective and subjective measures (Ketokivi & Schroeder, 2004). Accordingly, they encourage scholars to pay more attention to finding out salient performance components of firm performance and applying multiple items and multiple respondents preferably (Ketokivi & Schroeder, 2004). Besides, Wall et al. (2004) studied three samples separately and asserted that subjective and objective measures of performance show high level of convergent validity (i.e., the connections between both indicators were positive) and average discriminant validity. That is, the associations between subjective and objective measures of productivity and profit during the same period were higher than those during different periods; and the associations between productivity and profit measures were higher when both subjective and objective were utilized than those when either only subjective or only objective measures were applied (Wall et al., 2004). Moreover, they detect significant evidence of construct validity demonstrated by the equivalent associations of subjective and objective performance measures with a range of independent variables (Wall et al., 2004). While many empirical researches propose that subjective performance measures can be a possible alternative, Richard et al. (2008) recommend that scholars must provide a proper balance between subjective and objective measures aligned with their study contexts and consider their research design.

To sum up, general advice for applying subjective indicators of firm performance are: (1) to expand a priori theory and empirically examine associations between operational performance and financial performance (Combs et al., 2005), (2) gathering indicators from multiple dimensions using multiple items (Combs et al., 2005; Ketokivi & Schroeder, 2004); (3) to use multiple informants (Ketokivi & Schroeder, 2004; Venkatraman & Ramanujam, 1987); (4) to pay attention to employing quasi-objective measures or giving cues for participants to the performance dimension of interest to minimize measurement error (Combs et al., 2005; Dess & Robinson, 1984; Richard et al., 2008), (5) to keep away from indicators those are composites of operational and organizational performance (Combs et al., 2005); and (6) to assess validity of chosen measures through evaluating convergent and discriminant validity (Ketokivi & Schroeder, 2004; Wall et al., 2004).

2.9 Underlying Theories of the Study

Isaac Newton once wrote a note to Robert Hooke and remarked that "if I see further, it is because I stand on the shoulders of giants." Likewise, the area of intellectual capital is deeply indebted to scholars who provide a solid base for contemporary organizational theory (Siegel, 2004). Despite the fact that the researchers like Stewart (1991, 1994), Edvinsson (1997), Itami (1987), and Roos and Roos (1997) endeavored to create a public awareness of the conception of "intellectual capital", their studies depend upon the analytical models of these scholars, particularly those who scrutinized how corporate knowledge is developed and utilized to enjoy competitive advantage (Siegel, 2004). It would be useful to underline some of the seminal research in organizational theory and knowledge management which lay the foundation for the field of IC.

According to Roos, Roos, Dragonetti, & Edvinsson (1997), the theoretical roots of IC are classified into two major approaches, namely the strategic approach which addresses classification, creation, management, and use of IC; and the measurement approach, which expanded metrics and measurement models that determine the status of IC (Roos, Roos, Dragonetti & Edvinsson, 1997; Tan, Plowman & Hancock, 2008). Looking from a strategic perspective, IC, and especially knowledge, is deployed in order to derive and administer intangibles and enhance the value of a firm (Roos et al., 1997). Intangible assets are regarded as enablers, as they convert productive resources into value-added assets (Hall, 1992). It can be concluded from this that strategic and measurement streams complement each other. According to Roos et al. (2001), IC is generally should be oriented towards the perspective of an integrative, dynamic Resource-Based View (hereafter RBV) of the organization. Performance variations can merely arise when effective entities own precious resources, which are not possessed by other firms where competitive advantage is the consequence of procedures of resource acquisition and exploitation inside the firm (Barney, 1991). However, the RBV of the organization per se is not adequate to rationalize the studies in IC due to the fact that superior entities need a systematic employment of opportunities to move towards the productivity of knowledge work and the knowledge worker (Drucker, 1993). Hence, the knowledge-based view (KBV) of the firm should supplement the RBV of the firm. In fact, this point of view has been emerged as a normal evolution of the RBV of the firm. Besides, the fundamental notion, which is central to strategic approach, implies that there is a lack of approach to organize a business as underpinned by the contingency theory.

2.9.1 Contingency Theory

From the contingency lens, the optimal design for an organization depends on the temperament of its operating environment (Chapman, 1997; Galbraith, 1973; Otley, 1980; Woodward, Dawson, & Wedderburn, 1965). The contingency theory regards the environment or the internal/external context of a system or an organization to strongly influence the performance and efficiency of a system. It is also assumed that there is a lack of universally applicable systems, however, the systems are expected to adapt to a specific context in order for it to be efficient (Schreyögg & Steinmann, 1987). The contingency-based view combines decision-based approach and system-theory. The decision-based approach is made up of a very narrow viewpoint, while system theory is highly formalistic. From this integration, the contingency theory is representative of an open system with "if-then"-relationships, emphasizing relations within and around the corporation as the defined system (Lawrence, Lorsch, & Garrison, 1967). The contingency theory is framed by the general hypothesis, stating that organizations having internal features that best match their situation-specific demands will realize the best levels of adaptation (Scott, 1967).

The contingency theory is salient vis-à-vis management accounting and control system research (Fisher, 1998; Gordon & Miller, 1976; Hayes, 1977; Otley, 1980). In general, the contingency theory of management accounting assumes that there doesn't exist one single MAS which applicable to all entities. The contingency theory of management accounting attempts to show how the form of an organization's management control system is figured with special contingencies (Otley, 1980). The most suitable management control system is depending upon the conditions confront with the firm in which achievement must happen. According to

Loft (1991), the progress of accounting must be mostly perceived as a constitutive of new needs rather than a reaction to them. As companies deal greater uncertainties, accounting, as an information system, plays an important part in the improvement of them (Huang, Tayles, & Luther, 2010).

Although there is ample evidence to support a positive impact of intellectual capital on corporate market values (Chen, Cheng, & Hwang, 2005; Choi, Kwon, & Lobo, 2000) and financial performance (Bontis et al., 2000; Chen et al., 2005; Wang & Chang, 2005; Youndt, Subramaniam, & Snell, 2004), not all point towards a positive relationship; some indicate negative relationships as well. For example, in a study that explored the link between innovation, IT, and performance, the researchers found a nonlinear association between innovation capital and business performance (Huang and Liu, 2005). Similarly, Firer and Williams (2003) discovered an inverse relationship between human capital and VAIC (Value Added Intellectual Coefficient or also known as the Value Creation Efficiency Analysis) measures in the South African Market. On the other hand, some studies fail to discover any link between components of intellectual capital and performances (Chen et al., 2005; Fernandes, Mills, & Fleury, 2005). This is suggestive of the fact that higher ICs are not always appreciated, and is more reliant upon context than one might think, which might significantly vary the level of IC within organizations.

The foregoing argument drives us to the contingency theory. From contingency lens, entities achieve effectiveness via tailoring the features of the firm to manifesting contingencies vis-à-vis the condition of the firm, e.g. organizational environment, organizational size, and organizational strategy (contingencies)

influence firms' structure (characteristic) (Donaldson, 2001). Population ecology resembles contingency theory, as it completely presumes that the top organizations survive at any period of time, which renders 'Fit' an outcome of evolution (Gerdin & Greve, 2004). Gerdin (2005) questioned this view by pointing out the existence of misfit (fit) between contingency and structural variables, leading to lower (higher) performance at least over a short period of time.

Contingencies stemming from the operational environment influence the element of intellectual capital that can be perceived as characteristics of an entity. According to Pitkanen (2007) the factors of intellectual capital and the contingencies should fit with each other if an entity wishes struggling to survive. It's believed that the accessibility of internal IC information adapts to fit operational environment or contingencies (Huang et al., 2010). However, some empirical findings such as Wang and Chang (2005) and also Claycomb, Dröge, and Germain (2001) which focusing on external information and value, contended that firm's value and financial performance is positively affected by IC. Scarce researches conceptualize and clarify the association between contingency/operational factors and intellectual capital in a systematic manner.

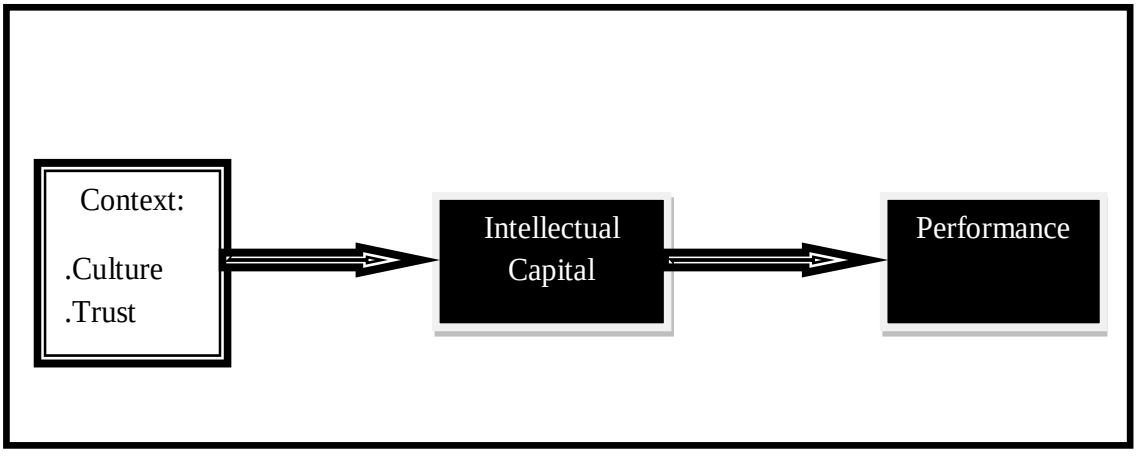


Figure 2.11
Intellectual Capital from Contingency Lens

As explained before, intellectual capital literature provides relatively sufficient supports that business's performance is influenced by intellectual capital. This line of study, which is also considered as one of the main topics of interest to the current work, is shown in Figure 2.11. This study particularly employs contingency theory and tries to explicate the association between two contextual factors, namely organizational culture and trust (as the two antecedent drivers of IC) and intellectual capital, shown to be on the left on the same figure. As per the selected type contingency theory, it is believed that an organization's intellectual capital will tailor itself to fit contextual or contingencies factors (Selto, Renner, & Young, 1995), which in turn brings about optimization between structural variables (dimensions of IC) and contingency. According to Fisher (1998), contingent factors which are prominent in research literature classified under five groups: (1) Uncertainty (task and environment); (2) Technology and interdependence (small batch, large batch, process technology and mass production with interdependencies being either pooled, sequential and reciprocal); (3) Business unit and industry characteristics (e.g. size, diversification, firm structure and regulation); (4) Competitive strategy and mission; and (5) Observability factors. In this particular research, as mentioned above, two antecedent variables i.e. organizational culture and trust represent the contextual factors, which could impact IC main components (Bontis, 1999).

In addition to the above discussion which highlights the importance of contingency view for justifying the effect of two antecedent variables (i.e. culture and trust) on the IC's main components, the concept of fit which itself derived from contingency theory also underpins the current study with regard to mediating role

of PMS in the relationship between IC and performance. Specifically, the second part of the framework of the current research (i.e. mediating effect of PMS) is heavily underpinned by the concept of ‘‘fit as mediation’’ proposed by Venkatraman (1989) which will be discussed in more details below.

2.9.1.1 The Concept of Fit

The concept of fit is an underlying subject in structural contingency theory (Drazin & Van de Ven, 1985). Moreover, it is widely acknowledged and argued to be pivotal to managerial behavior and organizational analysis (Delery & Doty, 1996; Miles & Snow, 1984). Its central premise is that firm performance is a consequence of fit among two or more elements; for instance, fit among organization environment, strategy, structure, system, style, and culture (Drazin &, Van de Ven 1985). As Drazin and Van de Ven (1985) argued, there are three various conceptual approaches to fit, namely, the selection, interaction, and systems approaches. In addition, Venkatraman (1989) also has presented precise guidelines for translating six distinct approaches of fit, each with its conceptualization and analytical issues (see Table 2.4). These six perspectives of fit provide alternative perspectives of the concept of fit in strategy research. Two perspectives, fit as moderation and fit as profile deviation are respectively akin to interaction approach and systems approach proposed by Drazin and Van de Ven (1985). These six perspectives fall into two classifications based on the number of variables being simultaneously investigated. Hence, fit as matching, moderation, and mediation could be classified into the reductionistic perspective, while fit as gestalts, covariation, and profile deviation could be considered as holistic perspective (Venkatraman & Prescot, 1990).

Table 2.4: Comparing Alternative Perspectives of the Concept of Fit in Strategy Research

	Perspectives					
Key Characteristics	Fit as Moderation	Fit as Mediation	Fit as Matching	Fit as Gestalt	Fit as Profile Deviation	Fit as Covariation
Underlying conceptualization	Interaction	Intervention	Matching	Internal congruence	Adherence to a specified profile	Internal consistency
Verbalization of strategy proposition	The interactive effects of strategy and managerial characteristics have implications for performance	Market share is a key intervening variable between strategy and performance	The match between strategy and structure enhances administrative efficiency	The nature of internal congruence among a set of strategic variables differs across "high" and "low" performance businesses	The degree of adherence to a specified profile has a significant effect on performance	The degree of internal consistency in resource allocations has significant effect on performance
Number of variables in the specification of fit	Two	Two to multiple	Two	Multiple	Multiple	Four to multiple
Analytical scheme(s) for testing fit	ANOVA Moderated regression analysis (MRA) Subgroup analysis	Path-analysis	ANOVA Deviation score Residual analysis	Numerical taxonomical methods – cluster analysis, factor analysis	The calculation of deviation as a eucledian distance in n-dimensional space MDS	Second-order factor analysis (confirmatory)
Measure of fit	Statistical derivation	Statistical derivation	Interval-level measure	Ordinal/interval measure	Interval measure	Interval measure
Illustrative references	Gupta & Govindarajan (1984) Prescott (1986)	Prescott, Kohli, & Venkatraman (1986)	Chandler (1962) Bourgeois (1985) Joyce, Slocum, & Von Glinow (1982), Dewar & Werbel (1979)	Miller & Friesen (1984) Hambrick (1984)	Drazin & Van de Ven (1985) Venkatraman & Prescott (in press)	Venkatraman (1986) Venkatraman & Walker (1989)

Source: Venkatraman (1989, p. 423-444)

"Fit as moderation" is in line with Drazin and Van de Ven's (1985) assumption of fit as interaction. From this criterion-specific approach, fit is perceived as the interaction between two predictor variables. This association is the effect of an independent variable (e.g., strategy) on a criterion variable (e.g., performance), that is contingent on a third factor (e.g., environment) which is labeled as a moderator (Venkatraman, 1989). "Fit as mediation", which is the case in the current study, assumes that one of the antecedent variables (intellectual capital) determines the other antecedent variable (performance measurement system), which in turn determines the criterion variable (organizational performance). More specifically, the first antecedent variable (intellectual capital) has a primarily indirect effect on the criterion variable (organizational performance). A very notable instance of such perspective is the environment-structure-performance paradigm in organizational research.

To conclude, drawing upon the "fit as mediation" approach of contingency view (Drazin & Van de Ven, 1985; Venkatraman, 1989), which assumes that knowledge features (e.g. the types of intangible assets) determines the design and implementation of the particular mechanisms (e.g. PMS) which in turn facilitate information processing (Galbraith, 1973; Thompson, Scott, & Zald, 2009), this study particularly explores the mediating effect of PMS in the association between IC and organizational performance to shed light on how such chains of cause-and effect relationships (Kaplan & Norton, 2001b) are established. From this vantage point, it is assumed that knowledge may is not per se valuable unless it could be effectively captured, measured, and managed through employing appropriate PMS (Kaplan & Norton; Widener, 2006). In this respect, the maxim that "if you can't measure it, you can't manage it" (Kaplan and Norton, 1996 p. 21) lends support to

this assumption that organizational performance would be positively affected through the measurement of the organization's fundamental critical success factors such as strategic assets and capacities. This implies that some of the advantages stem from the intellectual capital may influence firm performance indirectly through the emphasis put on the usage of PMS.

Other than the contingency theory which holds all these variables together, the inclusion of culture and trust as well as four main components of IC also could be argued from the perspective of the resource-based view (RBV) of the firm (Barney, 1991)

2.9.2 The Resource-based View of the Firm

Penrose (Penrose, 1959) was the person who originally introduced the resource-based view (RBV) and afterward, Wernerfelt (1984) and Rumelt (1984) tried to realize the notion. The RBV of the firm assumes that company's sustainable advantage in a given market can be determined by the organization's resources and capabilities. RBV proponents hold that organizations are distinctive entities defined by their private resources (Barney, 1991; Nelson & Winter, 1982). Intellectual capital of the organization is classified under such resources (Marr et al., 2003; Roos et al., 1998; Stewart, 1997; Sveiby, 1997b, 2001). Penrose (1959) places importance on the internal resources of a company, which in this context means the productive services that are derived from a company's own resources. In order to understand the important role of the organization's "inherited" assets, the environment is visualized in the entrepreneur's mind, detailing opportunities and constraints that they might come across. This image would influence an entity's behavior. She noted that the main difference between economic activity within an

organization and economic activity within the market lies in the fact that economic activity within the organization is rendered in an administrative firm, whereas economic activity inside the context of market is not. She also pointed out the fact that both markets and organizations interact with their respective environments, and each being co-dependent on the other for their respective survival.

Penrose (1959) believes that a firm is much larger than an administrative body; it is regarded as more of a gathering of resources that are productive, where the usage of these resources is determined via administrative decisions. Capital of an organization embraces tangible resources, such as plant, equipment, land, and natural resources, raw materials, semi-finished goods, waste products and by-products, and even the unsold stock of finished goods. Humans are also considered to be a firm's resource - unskilled and skilled labor, clerical, administrative, financial, legal, technical, and managerial staff. Penrose (1959) further posits that in actuality, it is not the resources themselves that are inputs to the production processes, it is only vital towards the delivery of services. Resources are regarded as a collection of available services that could be described separately from their usage, whereas services could not be described as much. This distinction is what spelled out the differences, or rather, uniqueness, of individual firms. Besides, she referred managerial capability, product or factor market and uncertainty as impediments to the organizational development.

Wernerfelt (1984) developed the notion additionally by stating the fact that strategy balances the deployment of available assets, and the expansion of novel potential resources. Barney (1991), based on prior work, suggested four benchmarks for evaluating what types of resources that are capable of championing

sustainable competitive advantages: (1) valuable, (2) rare compared to the competition (3) imitable and (4) non-substitutable. According to Roos and Roos (1997), the only resource that met the aforementioned benchmarks is “knowledge” -- irrespective of whether it is termed as invisible assets, absorptive capacity, core competencies, strategic assets, core capabilities, intangible resources, organizational memory, or other concepts with similar meaning. Roos and Roos (1997) refer to IC as the most contributing factor to gaining competitive advantage. They further pointed out that a systematic method for measuring IC is considerably pivotal to organizations irrespective of the industry, size, age, ownership, and geographical factors.

2.9.3 The Knowledge-based View of the Firm

It is widely acknowledged that the knowledge-based view (KBV) of the firm is a recent addition to the RBV (Balogun & Jenkins, 2003; Choo & Bontis, 2002; De Carolis, 2002; Grant, 1996; Hoskisson, Hitt, Wan, & Yiu, 1999; Huizing & Bouman, 2002; Roos, 1998; Sveiby, 2001). KBV posits that knowledge is imperative to strategic resource, and acts as an extension to the RBV of the firm (De Carolis, 2002). KBVs extension to RBV is expected to be enough in the context of the current economic context (Drucker, 1993; Guthrie, 2001; Mathews, 2003; Stewart & Ruckdeschel, 1998). In the context of this work, intangible assets are regarded as highly valued resources (Bontis, Dragonetti, Jacobsen, & Roos, 1999; Petrick, Scherer, Brodzinski, Quinn, & Ainina, 1999).

Assuming that knowledge is regarded as a resource, it theoretically connects RBV to the KBV (Ariely, 2003). The KBV residing in the firm is a current addition to the RBV, which is made possible by inherent capabilities of a firm (Malerba &

Orsenigo, 2000). Competition is framed by capabilities, and the idea of increasing return was first put forth by Edith Penrose (1959), and was further refined by Wernerfelt (1984), and Rumelt (1984). They are regarded as developers and refiners of modern RBV in firms (Foss, 1997). KBV of the firm acts as an extension of RBV, as it regards organizations as heterogeneous bodies that are filled with knowledge (Hoskisson et al., 1999). Organizations acting on resource base are increasingly being filled with knowledge based assets (Roos et al., 1997; Stewart, 1997; Sveiby, 2001b; Marr, 2004). RBV suggests that the unique individuality of intangible resources (especially knowledge) refines the emphasis of the research (Rouse & Daellenbach, 2002). The resource of knowledge is imperative in order to confirm the fact that competitive advantages are maintained, due to the fact that these resources are difficult to copy, and act as a foundation for sustainable differentiation (Wiklund & Shepherd, 2003).

Firm's KBV has garnered sufficient interest, as it is reflective of the fact that the field of academia acknowledges the fundamental economic fluctuations resulting from the cumulative and the availability of knowledge for the past twenty years (Marr, 2004). The shift from manufacturing to services in most developed economies is built upon the tweaking of information and symbols instead of physical products (Fulk & DeSanctis, 1995). Conner and Prahalad (2002) are adamant that a body of literature exists that considers a firm's KBV as the foundation of its RBV. These authors are also sure that the strategic management literature of the RBV regards knowledge as supporting competition. A firm's RBV should integrate temporal evolution of its resources, along with the capabilities that upheld competitive advantages (Helfat & Peteraf, 2003), which was duly realized via "dynamic capabilities".

Contradicting the fact that knowledge is a resource (Sullivan, 1999), there are some parties who regard knowledge in terms of creative capacity. Instead of deriving values from intangible resources, the core of the knowledge-based perspective is made up of value criteria within the organization itself. The knowledge-based perspective is integrated into the system or management theory, where it is regarded as a system that is made up of parts that are interdependent (Cole, 2004). Despite the fact that it is imperative to investigate each component that makes up an organization, it is also salient that we do not lose sight of the relationship between these respective components and the organization. As a matter of fact, IC is regarded as a combination of interdependent intangible assets.

2.10 Intellectual Capital and Organizational Performance

One of the critical resource and enhancer of firm performance and value creation is intellectual capital (Itami, 1991; Teece, 1998; Mayo, 2000). The fact that makes a business successful hinges upon the function of the quality of the knowledge contents that are available to construct and expand reliable products and services, tailored to the specific requirements of individuals (Wiig, 1997). Research that emphasizes intangible assets is ubiquitous (both theoretical and empirical). According to Narver and Slater (1990), business performance (ROA), relational capital, and market orientation are closely connected. Along the same lines, Jaworski and Kohli (1993) observed market orientation as a major determinant of performance on a study of 222 US business units. Many precious changes and considerable successes are achieved by intellectual capital through understanding, developing and managing the firm's intangible assets, which are the most imperative intangible resource in the organization (Nonaka & Takeuchi, 1996).

Lev and Sougiannis (1996) investigated the relationship between intangibles and financial measures. Edvinsson (1997) detected the 'hidden values' of a company, using it to construct an IC management model. He utilized the work of Sveiby's (1994), basing his work on concepts of reporting external capitals, re-labeling these intangible assets as IC. Bontis (1998) uncovered the link between IC and business performance, while Bontis et al. (2000) also revealed that human, customer, and structural capital have a direct correlation with business performance, with the notable exception of industry type (service and non-service organizations). Chen et al. (2004) also unearthed an imperative link between four elements (customer, innovation, structural and human capital) of IC and business performances. They also proved the existence of a significant link between the elements of IC. Finally, Tseng and Goo (2005) analyzed the link between IC and value creation. They utilized three financial methods for value creation, along with the link between four elements of IC (human, structural, customer and innovation) and corporate value. The empirical results proved the existence of a direct correlation between IC and corporate value.

Bontis (2000) posited that market orientation is embedded in the conceptualization of relational capital. Narver and Slater (1990) determined that market orientation and business performance (ROA) are directly correlated. Jaworski and Kohli (1993) reported on a study that utilized 222 US business units, putting forth the idea that market orientation is imperative vis-à-vis performance, regardless of the presence of market turbulence, competitive intensity, and technological turbulence. Ruekert (1992) reported a direct correlation between the degree of market orientation and long-run financial performance. In the UK,

Greenley (1995) made the observation that a collection of companies with higher market orientation is superior in terms of (ROI) compared to groups having lower market orientation. Lusch and Laczniak (1987) analyzed how a company's increased focus on extended marketing concept that is similar to market orientation is directly correlated to financial performance.

2.11 Intellectual Capital and Performance Measurement System

Global markets have experienced a transition from capital-intensive industries into knowledge-based industries, possessing higher propensities to move towards intangible resources. Traditional PMS with a limited set of measures are not any more applicable to measuring the performance of such firms, which possess high intangible resources. The companies such as Microsoft are built on a foundation of the long-run value embedded in their IC resources and their continuing innovativeness (Barsky & Bremser, 1999). The benefits derive from IC are difficult to measure, such as learning, innovation, customer satisfaction, R&D, and market knowledge. Accordingly, it's plausible to conclude that traditional performance measurement systems are not workable in today's knowledge-based economy that consists of innovative business context and realities (Amaratunga et al., 2001). This is evident via the fact that the market value of high IC firms normally exceeds book value. That is, the conventional PMS are incapable of capturing and monitoring integrated elements of performance. For example, as Amir and Lev (1996) are adamant of the fact that almost 40 per cent of the market valuations of average firms are missing from their balance sheets. In cases of high-technology firms, the rate is 50 per cent. However, this can be contingent upon the going on in the stock market. According to Amaratunga et al. (2001), 70 per cent of investors base 30 per cent of their decisions upon non-financial performance; with financial analysts

following suit, via placing emphasis upon the exploitation of non-financial indicators, due to the fact that they are able to provide more accurate prediction. Drucker and Drucker address the issue (Drucker & Drucker, 1993):

> "……a traditional measure is not adequate for business evaluation. A primary reason why traditional measures fail to meet new business is that most measures are lagging indicators. The emphasis of accounting measures has been on historical statement of financial performance. They are the result of financial management performance, not the cause of it."

Tayles et al. (2002) regard internal management figures as defining and quantifying the responsibilities and influence of intellectual capital to turn into real strategic value. It is of more significance in modern companies to use the relevant treatment of intellectual capital within the function of management accounting. Focus has moved on from 'what we own' to 'what we know', and attempts to quantify intangible assets are considered both a strategic challenge and a value-adding activity. However, it must not be forgotten that real danger of converting intellectual assets into 'hidden' value is always present. Organizations that did not succeed in engaging innovative and strategic PMS, or emphasized its evaluation, appraisal and measurement, will neglect of what may prove be the organization's most valuable resource (Tayles et al., 2002).

2.11.1 Intellectual Capital and Diversity of Measurement

PMS is applied by organizations in two forms; traditional and non-traditional (Kaplan and Norton, 1996). The core purpose of a single measure is indicative of whether it is traditional or not, regardless of whether the measure is financial or otherwise. Traditional measures are defined as aggregate financial information that are obtained from the original financial statements and budgets, and are inclusive of

measures such as net income, budget variances, and return-on-assets (Ittner and Larcker, 1995). They are regarded as lagged measures that report the performance of organizations, and disseminate pertinent information regarding the firm's capabilities and resources (Kaplan and Norton, 1996). Non-traditional information is inclusive of measures that directly target firm operations and strategic objectives (Ittner and Larcker, 1995). It provides information on future performances and on the intellectual capabilities and resources that firms are utilizing in the current economy (Kaplan & Norton, 1996; Lev, 2001; Simons, 2000; Widener, 2006). Costs of quality, training costs, and employee productivity are examples of non-traditional financial measures, while customer satisfaction, employee satisfaction, and cycle time are examples of non-traditional non-financial measures.

In order to manage the critical success factors in the current business climate, performance measurement systems encompass multiple measures (Kaplan & Norton, 1996; IFAC, 1998). As an example of this, quite a number of firms are integrating balanced scorecard systems that include measures across a broad range of firm activities. Economic theory (i.e., the informativeness principle) also suggests that firms prioritize multiple measures, as long as it provides information beyond that contained within traditional financial measures (Feltham & Xie, 1994). Therefore, regardless of which strategic resource a firm relies on, firms will prioritize multiple types of measures (more diversity of measurement) in their performance measurement system (Kaplan & Norton, 1996).

2.11.2 Intellectual Capital and the Balanced Use of PMS

Henri (2006a) is of the opinion that depending on cybernetic logic and being indicative of traditional control systems, the diagnostic utilization of PMS is not

regarded as an adequate method of fostering intangible capabilities, such as market orientation, innovativeness, and organizational learning, most of which are tangled with customer/relational capital, structural capital, and human capital, respectively. Put differently, market orientation, innovativeness and organizational learning are regarded as the main element of intellectual capital, and somehow can be represented as a firms' IC level. Diagnostic utilization is indicative of two important features that are directly linked to mechanistic controls: (i) tight control of operations and strategies, and (ii) highly structured channels of communication and restricted flows of information (Burns & Stalker, 1961). From a global point of view, there is an inherent disparity between the needs of intellectual capabilities and the mechanistic usage of control systems (Chenhall & Morris, 1995; Galbraith, 1983).

Diagnostic utilization is linked with tight control of operations and strategies via sophisticated control systems. These systems are inclusive of action plans that were extracted from strategies, detailed financial targets, comparison of actual outcomes with targets, and explanation of variances. This formal usage of PMS paves the way for a mechanistic approach to decision-making, which results in organizational inattention towards changing circumstances, and the requirement for innovation (Van de Ven, 1986). Furthermore, the concept of organizational learning covers both the notion of single-and double-loop learning (Argyris & Schön, 1978a). Diagnostic utilization represents single-loop learning instead of a higher-level learning (double-loop), which is in turn imperative towards the formation of innovative behaviors (Haas & Kleingeld, 1999). Hence, diagnostic use of PMS has the potential to cause difficulties in the use of the intellectual capabilities via the provision of boundaries and confining risk-taking. Overall, diagnostic usage of

PMS impedes the potential for learning and innovation (Argyris, 1990). Accordingly, it can be expected that firms with low levels of IC, which deemphasize factors such as innovativeness, learning and customer orientation tend more to use the diagnostic type of MCS, because this type of MCS confines the deployment of intangible capabilities by demarcating boundaries and limiting risk-taking.

On the other hand, managing integrated organizational tension that is ever-present, along with creative innovation and predictable goal achievement, the interactive usage of PMS props the construction of ideas and creativity. Indeed, it is widely acknowledged that interactive usage possesses the supremacy to embody a positive trigger that creates creative and inspirational forces: "…senior managers use interactive control systems to build internal pressure to break out of narrow search routines, stimulate opportunity- seeking, and encourage the emergence of new strategic initiatives" (Simons, 1995, p. 93). Dent (1990) is of the thought that curiosity and experimentation can be encouraged via control systems. Both are capable of creating fresh images of the organization for its employees, as the organization interacts with its respective environment. This makes combining obsolete paradigms and organizational attempts in the form of uncoupled (unlearning) and recoupled in different ways (learning) possible.

Henri (2006a) is of the believe that the act of relying on organizational dialogue and signaling, along with the interactive usage of PMS is representative of an adequate mean of encouraging intellectual capabilities, such as market orientation, entrepreneurship, innovativeness, and organizational learning. Interactive usage are reflective of two important features that are linked to organic

controls: (i) loose and informal control reflecting the norms of cooperation, communication and an emphasis on getting things done, and (ii) open channels of communication and free flow of information throughout the organization (Burns & Stalker, 1961). On a global platform, it is quite natural for both the requirements of such capabilities and organic use of control systems to fit each other (Chenhall & Morris, 1995; Van de Ven, 1986).

2.12 The Balanced Use of PMS and Diversity of Measurement

A monitoring usage of PMS representing diagnostic approaches is reflective of a cybernetic approach, which covers both financial and non-financial measures. However, it is regarded that monitoring is more closely associated with financial information compared to non-financial measures, indicating smaller measurement diversity. As is usually the case, information on finances is more strongly correlated to traditional planning and control cycles, where the outcomes are measured against preset standards in order to identify variances and address deviations. Traditional PMS emphasized financial accounting information (Johnson & Kaplan, 1987). As Nanni, Dixon, and Vollmann (1992, p. 13) argued: ‘‘They [planning and control] are by nature integrated into a whole, but traditional accounting-based planning and control methods artificially separate them into a future desired state in financial terms, and periodic checking to see whether that financial state is being approached at the planned rate’’. Goold and Quinn (1990) pointed out that budgetary control emphasized financial objectives only upon the coming 12 months, and neglects non-financial objectives that might be salient to future realization of secure profitability and competitive strength. The existence of a budget, acting as a financial control system, needs constant monitoring. Furthermore, monitoring usage is not linked to internal control purposes, but opens a channel of communication between

stockholders, investment analysts, lenders, government, etc. (Burchell et al., 1980; Simons, 2000).

On the other hand, attention-focusing usage of PMS, representing the interactive usage, aims to disseminate signals and stimulate communication within the organization. Financial information that reports negative variances against initial expectations focuses attention and trigger discussion whenever the results are published. Vandenbosch (1999) pointed out the fact that these resulting discussions might result in mitigating actions. Previous studies unearthed several advantages of non-financial measures, including superior predictive ability, directly linked to strategic actions, more actionable, and timelier than financial measures (Ittner & Larcker, 1998). Thus, non-financial measures enhance dialogues and discussions within the organization, encourage attention focusing on strategic priorities and uncertainties, and foster the learning and the emergence of fresh strategic patterns. Linked to strategic actions and actionability, these measures are utilized in a forum to begin arguments, debate, insights, and new action plans. In summary, both financial and non-financial measures are usable vis-à-vis focusing organizational attention.

2.13 Performance Measurement System and Organizational Performance

There are quite a large number of literatures on performance measurement on both financial and non-financial performance measures (Banker, Potter, & Srinivasan, 2000; Bhimani & Langfield-Smith, 2007; Chenhall, 1997; Ittner, Larcker, & Rajan, 1997). There are also quite a large number of researches that investigates the influence of PM on financial performance (Hoque & James, 2000;

Ittner & Larcker, 2001; Stede, Chow, & Lin, 2006). Performance measurement is a mechanism that assigns roles and decision rights, set performance targets, and reward the realization of targets (Merchant & Van der Stede, 2007; Otley, 1999). In order to effectively execute this responsibility, innovation is a must vis-à-vis the means of gauging performance within organizations (Chenhall & Langfield-Smith, 1998; Ittner & Larcker, 1998b; Kaplan & Norton, 1996, 2001; Libby & Waterhouse, 1996; Lillis, 2002). The easiest way to develop an innovative performance measurement is the usage of extended diversity of measures in a broad setting of financial and non-financial measures (Ittner, Larcker, & Randall, 2003). Supporters of this approach posit that it can result in superior firm performances (e.g., Banker et al., 2000; Lingle & Schiemann, 1996; Hoque & James, 2000).

One of the big parts of an information system is facilitating managerial decision-making and controls (Abernethy & Bouwens, 2005). Gupta (1987) said that if a firm's strategic information processing ability fails to meet its requirements, the decisions that make would be imperfect or late, thus lead to poor performance. These prospects originated from an economic viewpoint of decision making, emphasizing the fact that in uncertain fluid environment, the higher availability of multiple relevant information results in a more efficient resource allocation (Baines & Langfield-Smith, 2003) and a positive result probability (Christensen, Feltham, & Şabac, 2003). Provisional relationship is assumed, supporting further relevant and factual information into more effective managerial decisions, improving business performances (Baines & Langfield-Smith, 2003; Chenhall, 2003).

On the other hand, the balanced use of PMS has been extensively researched, focusing on the role of accounting as a diagnostic tool to gauge and reward managerial performances, despite the acknowledgement that accounting can serve as a dialogue, learning, and idea creation machine (Burchell et al., 1980). Simons regard this alternative role of accounting as 'interactive', more suitable for a knowledge-based economy. In this respect, Dixon et al. (1990) argued that PMS have developed in order to produce a series of mutually strong signals, which are able to drive managers into strategically critical parts that are interpreted as company performance outcomes. Attitude towards PMS recently has a more strategic and innovative orientation since the main purpose of initiation of such systems is converting strategy into a discernable set of performance measures (Chenhall, 2005), inducing managers to take into account crucial outcomes within corporations.

According to Henri (2006a), the interactive usage of PMS paves the way for channels of communication between superiors and their respective subordinates, which in turn results in the sharing of valuable sources of ideas and information, the engagement in creativity to generate solutions to perceived problems, and exploit potential opportunities. The interactive usage of PMS motivates employees to realize goal-directed behavior, provide employees with a voice, promote positive attitudes towards supervisors and tasks, and can be utilized to focus toward issues that influence performance, such as strategic uncertainties (Bisbe, Batista-Foguet, & Chenhall, 2007; Lind, Kanfer, & Earley, 1990; Simons, 1994b). The outcomes from the interactive usage of PMS enhance performances.

2.14 Chapter Summary

Drawing upon the comprehensive literature review presented in this chapter, intellectual capital is perceived as a key resource as well as driver of organizational performance. In a nutshell, this study offers a bigger picture and a holistic understanding of IC by empirically investigate a multidimensional view of IC through supplementing the organizational culture, trust, and social capital with the other three general IC components, namely human capital, structural capital, and relational capital. The chapter also highlighted the importance of management control system in general and performance measurement system in particular as a powerful lever in managing and measuring the firm's most critical assets, i.e. IC and knowledge related resources. With the above explanation, this chapter reviewed comprehensively previous studies from the literature relevant to the research area. This review of the literature commenced with a broad view of the research's constructs and variables and subsequently towards a narrow schematic view of issues addressed in this research. Specifically, the chapter presented an overview of the literature on the variables of interest, namely intellectual capital, performance measurement system, and organizational performance along with a comprehensive conceptualization for all the foregoing variables. This is followed by specifying the gaps within the related literature in order to underline the importance of further research in this field. The chapter also highlighted the theories underpin the study i.e. resource-based view, knowledge-based view, and contingency theory. The final section provided an explanation regarding the connections and linkages among all constructs of the study.

CHAPTER THREE
THEORETICAL FRAMEWORK AND HYPOTHESES DEVELOPMENT

3.0 Overview

As explained in chapter one, this study mainly aims to link the intellectual capital to one of the major elements of management control system, i.e. PMS and also their impact on organizational performance of Iranian organizations within the Tehran Stock Exchange (TSE). This study addresses PMS from two separate aspects. Firstly, the diversity of measurement in terms of a broad set of financial and nonfinancial measures (largely borrowed from Kaplan and Norton's BSC performance measures) is considered. Secondly, the balanced use of PMS in terms of interactive and diagnostic use (Simons' levers of control) is addressed. In addition, the study intends to investigate the mediating role of PMS in the relationship between intellectual capital and organizational performance. As depicted in Figure 3.1, this chapter commences with highlighting the gaps of the research in details drawing from literature review in the previous chapter. After specifying the gaps, the theoretical framework is presented followed by the literature justification for hypotheses development.

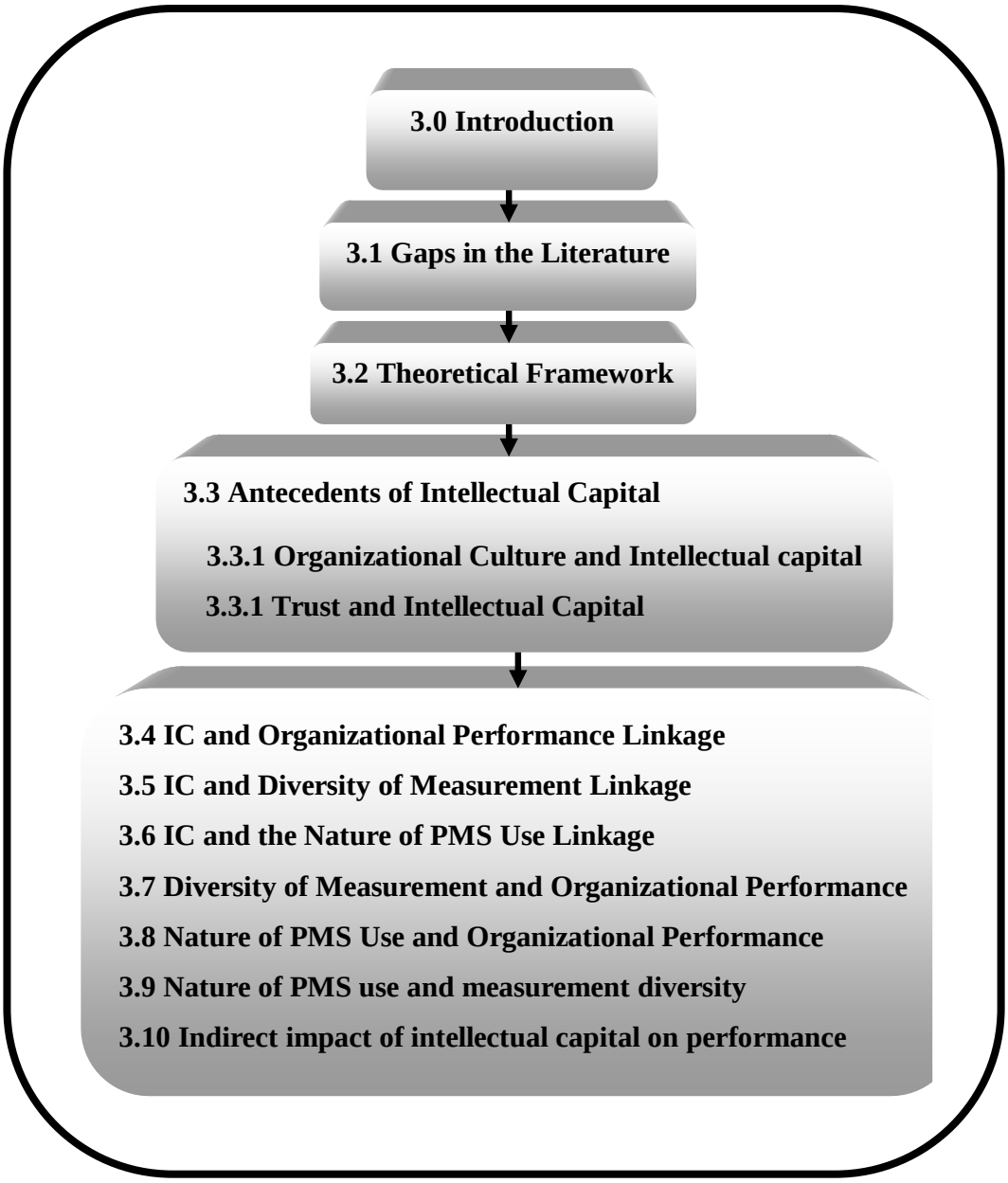


Figure 3.1
Overview of Chapter Three

3.1 Gaps in the Literature

As discussed comprehensively in the IC conceptualizations in the previous chapter, several perspectives on IC have been developed by scholars during last two decades. As presented in the chapter 2 (Literature Review), Table 2.4 summarizes

definitions, examples of operationalization, and related literature spanning the diverse fields. A close examination of the literature conveys several interesting points. First, an extensive review suggests that we need to take a multidimensional view of intellectual capital in order to parsimoniously capture the concept (as depicted in Figure 3.2, gap number 1). A consensus exists that none of the IC dimensions is alone valuable (Cabrita & Bontis, 2008). To fulfill the need for taking a multidimensional view, this research largely borrows one of the seminal conceptualizations of IC suggested by Bontis (1999) in which the IC multidimensional construct is supported by two drivers, namely culture and trust (see Figure 2.8 in chapter two). The current study treats these two IC drivers (Bontis, 1999; Cabrita & Bontis, 2008) merely as two antecedent variables of other main components of IC, namely (1) human capital, the collective knowledge of employees including experience, skills, and know-how; (2) structural capital, the specific knowledge owned by a firm such as technologies, processes, and data; (3) social capital, the knowledge emerged from informal interactions among the employees; and (4) relational capital, the knowledge embedded in relationships with external partners. The identified subdimensions imply that there are distinctive knowledge resources that firms can accumulate and utilize through individuals, structures, cultures and external partners (Berry, 2004; Stewart & Ruckdeschel, 1998; Subramaniam & Youndt, 2005).

Second, there is a varying degree of frequency that each of the aspects of intellectual capital is considered. Human capital and structural capital are included most frequently, while social capital and relational capital are referred to less in the literature. Most of the fields have focused on variables of greatest interest of their own. For example, the field of finance/accounting has addressed only measurable

assets, while disregarding the aspect of social capital. The marketing field has mainly focused on customer relationships as the most important intangible asset to obtain profit. Information system field has paid much attention to structural capital in terms of types of information technology system to support knowledge management. Combined with the first observation, this finding reveals the need to integrate all the specialized arguments from each field. Otherwise, the scattered arguments on IC will fail to offer a comprehensive and meaningful insight to practitioners regarding how to find and leverage important knowledge-related resources of a firm (Marr, 2012) [Figure 3.2, gap number 2]. Several recent empirical studies represent a more rigorous approach to the study of intellectual capital by accepting the multidimensional view (Menor et al., 2007; Subramaniam & Youndt, 2005; Yusoff et al., 2003). Yet, the examined constructs are defined and measured somewhat broadly so that more detailed discussion about how to manage various intellectual assets becomes difficult.

As elaborated in the problem statement section in chapter one, the other concern which motivates the current study stemming from the unobservable or intangible nature of the IC (Argote & Ingram, 2000). There is an unclear insight on how various forms of intangible resources are managed by the organization whereby such competitive advantage is gained and sustained (Barney, 1991; Nonaka, 1994; Wernerfelt, 1984). However, in spite of the intangible essence of IC, the organizations possess other more readily tangible attribute i.e. organizational control system which could be utilized to illuminate the properties and the others knowledge-related resources of a firm; Regardless of how control systems are defined, they possess an important characteristic which has overlooked in the literature, that is their capability to manage the flow of knowledge and IC inside the

organizations (Turner & Makhija, 2006). In this respect Simons et al. (2000) claimed that, the PMS as one of the major elements of MCS can be perceived as a powerful lever to facilitate and support management of strategic resources. To sum up, while the influence of knowledge-related resources on measurable performances has been considerably examined in the IC literature, little is known concerning the role that organizational control system in general and PMS in particular play in supporting the management of such organizations' most critical resources i.e. knowledge-related assets. Accordingly, concerning this problem this study intends to explore empirically the role of PMS between the relationship between IC and performance.

With the above discussion in mind, the gaps number 3 and 4 (Figure 3.2) signify the mediating role of PMS in IC-performance relationship. The famous maxim that "if you can't measure it, you can't manage it" or to put it another way, "you can't manage what you can't measure" (Kaplan and Norton, 1996, p. 21) conveys the message that organizational performance would be positively affected through the measurement of the organization's critical success factors such as strategic intangible assets and capacities (Kaplan and Norton, 1996). According to Widener (2006), once organizations acquire their strategic resources and capabilities, appropriate PMS would be employed in order to assist in the capturing and managing such vital resources Consequently, the providing useful feedback and information on that fundamental capital, which aimed at supporting entity in exploiting the strategic resource effectively, in turn leads to performance improvement. To sum up, the mediating effect of PMS are put forwarded based on the premise that organizations evaluate their potential in terms of fundamental

critical resources/capabilities and then utilize appropriate PMS (which are aligned with those assets) that consequently bring about performance improvement.

Finally, the other concern in this research is associated with performance measurement system [Gaps number 5 and 6]. According to the literature, one of the major impediments to organizations' success is attributed to their inability to develop a systematic and robust PMS (Usoff et al., 2002). In this regard, the majority of the studies has paid much attentions to topics concerning the diversity of measurement (or single-attribute) so far and the investigation of a multiple-feature of performance measurement system or PMS as a whole has overlooked in the literature (Henri, 2006b). Accordingly, this study intends to address performance measurement system from two separate but complementary aspects simultaneously which in turn provides a more systematic and robust performance measurement system [Gap number 6]. Moreover, and for the purpose of satisfying the need of a systematic and robust PMS, the four subdimensions of the construct of Diversity of Performance Measures (which is largely borrowed from Kaplan and Norton's BSC) are supplemented by new performance measures items classified under the heading of social and environmental perspective [Gap number 5] (Hoque & Adams, 2008). The summary of all the aforementioned gaps are illustrated in the Figure 3.2 for more clarification.

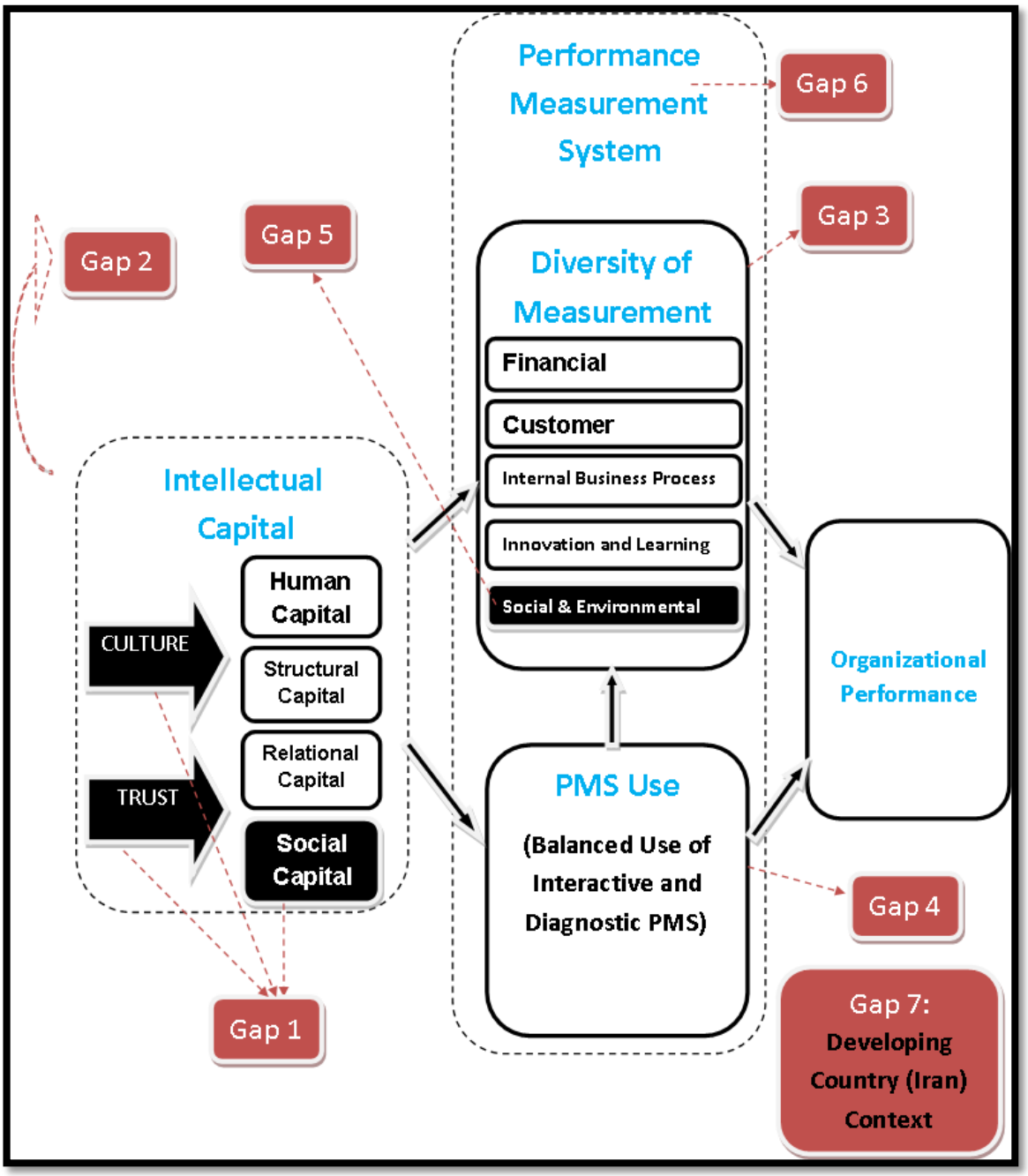


Figure 3.2
Gaps in the Literature

3.2 Theoretical Framework

As explained before, IC literature provides relatively sufficient supports that business's performance is influenced by intellectual capital. In addition to the resource-based view, this study particularly employs contingency theory and tries to explicate the association between two contextual factors, namely organizational

culture and trust (as the two antecedent drivers) and intellectual capital. According to the selected type contingency theory, it's believed that organization's intellectual capital adapts to fit contextual or contingency factors (Selto et al., 1995) that in turn brings about optimization between structural variables (dimensions of IC) and contingency. Although culture and trust classified under the IC conceptualization proposed by Bontis (1999), this study draw upon the contingency theory to justify the effect of these two antecedent variables on the other main IC components. This is in harmony with Bontis (1999) IC conceptualization as he refers to trust and culture as two drivers which are able to foster the IC development procedure.

More recently, there are some other scholars in the context of IC which advocate the necessity for expanding a framework involving the antecedent conditions which are vital for the efficient IC development (Cabrita & Bontis, 2008; Nazari et al, 2009; Isaac et al 2009; O'Brien, Clifford, & Southern, 2010; Bratianu, Jianu, & Vasilache, 2011). For example, Bratianu (2007) asserted that organizational culture as an integrator contributes particularly in developing an intellectual asset. Among the diverse literature which surrounds the notion of "organizational culture", there are many scholars who attach culture more significance than merely being element of the underlying cornerstones of an organization's success. This is consistent with the notion of Flamholtz (2002) that view the culture as "an area of essential organizational development, a strategic keystone for a successful company". From his vantage point, Copeland (2001) demonstrates that the definition of organizational culture is a crucial stage of the IC development.

Lin (2007) argued that trust in employees play a central part in willingness towards sharing tacit knowledge. In the same vein, Gainey and Klaas (2003) asserted that trust is a pivotal antecedent factor to client satisfaction in outsourcing of training and development, partly because of the presence of tacit knowledge. In the absence of any trust within organization, personally held knowledge will not be shared which this in turn can impedes the knowledge creation and development. Accordingly, as Isaac et al. (2009) argued, IC management processes rest largely upon trust. Ståhle and Hong (2002) in their argument concerning dynamic IC, corporate change, and self-renewal asserted that trust is critical not only among staff but also among leaders and their personnel. In relation to knowledge intensive companies, Horwitz et al. (2003) argued that trust, in addition to other factors, is an absolute necessity for converting tacit knowledge into explicit knowledge, which is pivotal to the development of either intellectual or social capital that is available by others in the company. In the same vein, Ferguson-Amores, García-Rodríguez, and Ruiz-Navarro (2005) asserted that trust is of vital importance to the learning organization. It is also crucial to developing networks in order to share the knowledge widely (Pöyhönen & Smedlund, 2004), as well as to enabling organizational members to be involved in decision making (Pučėtaitė & Lämsä, 2008).

As elaborated comprehensively in chapter two, the “fit as mediation” approach of contingency view (Venkatraman, Drazin & Van de Ven, 1985; 1989) assumes that knowledge features (e.g. types of intangible assets) determines the design and implementation of the particular mechanisms (e.g. PMS) which in turn facilitate information processing (Galbraith, 1973; Thompson et al., 2009). Relying upon this notion, this study particularly explore the mediating effect of PMS in the

association between IC and organizational performance to shed light on how such chains of cause-and effect relationships (Kaplan & Norton, 2001b) are established. From this vantage point, it is assumed that knowledge may is not per se valuable unless it could be effectively captured, measured, and managed through employing appropriate PMS (Kaplan & Norton; Widener, 2006). In this respect, the maxim that “if you can’t measure it, you can’t manage it” (Kaplan and Norton, 1996 p. 21) lends support to this assumption that organizational performance would be positively affected through the measurement of the organization’s fundamental critical success factors such as strategic assets and capacities. This implies that some of the advantages stem from the intellectual capital may influence firm performance indirectly through the emphasis put on the usage of PMS.

The resource-based view (RBV) forms the basis in coming up with a prime theory to be utilized in the field of knowledge management and intellectual capital, aptly named “knowledge based view” or “knowledge based theory”. The RBV was first suggested by Penrose (Penrose , 1959), and expanded upon by Wernerfelt (1984) and Rumelt (1997). This point of view posits that the sustainable advantage of a firm is heavily dependent upon its available resources. This is followed by the opinion that firms are characterized by their respective resources, with its own unique idiosyncrasies (Barney, 1991; Nelson & Winter, 1982). Marr (2012) decides that the literature regarding knowledge management can be classified into two major streams. The first utilizes an epistemological perspective, via regarding knowledge as a factor that is capable of separating information and knowledge, with significant effect on knowledge management. The second classification regards knowledge as an organizational tool that is highly useful in the enhancement of the performance of an organization. Studies that are regarded as

being classified in the first approach separate between knowledge, information and data (Alavi & Leidner, 2001). Alavi and Leidner (2001) summed up the current content of literature on the distinctions among data, information and knowledge by positing that data is formed by basic numbers and unprocessed facts, information forms the bulk of processed data, while knowledge is regarded "authenticated information". In the context of this work, knowledge is regarded as individual information on facts, procedures, ideas, and observation, which are embedded in the mind of people. The very personal nature of knowledge gives way to the fact that in order to make group knowledge viable, it has to be interpreted and understood by the individual possessing it. This rather personal nature of knowledge makes it highly exclusive, and difficult to distribute. This rather personal aspect of knowledge exists in each individual mind, and has its genesis in an individual contextual action, commitment, and connection, is known as "tacit knowledge" (Nonaka, 1994; Polanyi & Sen, 1983).

Moreover, explicit knowledge forms a systematic and codified knowledge that is accessible to everyone via the usage of a formal medium of instruction. That is discrete and digital compared to the more subjective nature of tacit knowledge. Explicit knowledge can be embedded in tools such as databases, archives, and libraries. However, organizational knowledge, in contrast with personal knowledge, will not promote without a continuous link between tacit and explicit knowledge (Nonaka, 1994). The vast majority of literature on knowledge management is mostly concentrated on characteristics, forms of knowledge, and its creation procedures (Alavi & Leidner, 2001; Nonaka, 1994). The second class of literature regarding knowledge management is mostly named "intellectual capital literature", and focuses upon the ways knowledge assets (IC) enhances organizational

performances. Zhou and Fink (2003) , in their work, underscored the dissimilarity between the first and second class of knowledge management by positing the fact that intellectual capital literature is linked to the higher echelon of management, while knowledge management mostly concerns the strategic know-how of knowledge. G. Roos and Roos (1997) underline this fact that it is actually the intellectual capital that brings the competitive edge. They believed that an efficient system for capturing and handling the IC is increasingly pivotal to organizations irrespective of size, industry, ownership, age, and geographical features. The aim of the above analysis is to provide a synopsis of the theoretical framework adopted in the current study. The aforementioned analysis is intended to summarize the theoretical framework that is adopted in this study.

In gist, it is mentioned in the RBV of strategy which organizations govern unique critical strategic resources which is beneficial to them in gaining and maintaining a strategic advantage. RBV presumes that, inside industries, underlying strategic assets are heterogeneous among organizations and not perfectly mobile (Barney, 1991). As Amit and Schoemaker (1993) asserted, IC is considered as one of the most predominant firms' strategic resources in the current advent of k-economy. IC is described as "the end result of a knowledge transformation process or the knowledge itself that is transformed into intellectual property or intellectual assets of the firm" (IFAC, 1998, p. 3) and is the most important driver towards gaining competitive edge in today's hyper-competitive world (Lev, 2001).

Resource-based View also assumes that organizations are not able to realize their benefits if their strategic resources (mainly include IC), are not managed appropriately (Coff, 1997). According to Simons et al. (2000), PMS is an effective

means and lever to support management of strategic resources. Relevant information in relation to the organization's underlying strategic resources and critical success factors are provided through PMS (Kaplan & Norton, 1996; Simons et al., 2000). In this respect, Kaplan and Norton (1996) asserted, appropriate management and measurement of the underlying critical success factors can influence organizational performance positively. Accordingly, this study intends to provide insights into this assertion and close the gap in the existing research through the collection and analysis of survey data by examining generally whether there is an association between the firms' level of IC and the adoption of specific types of PMS. In addition, whether the level of IC and also PMS will impact organizational performance positively; and finally, whether PMS would mediate the association between the firms' level of IC and performance. These assumptions will illustrate in more detail in the proposed theoretical model below.

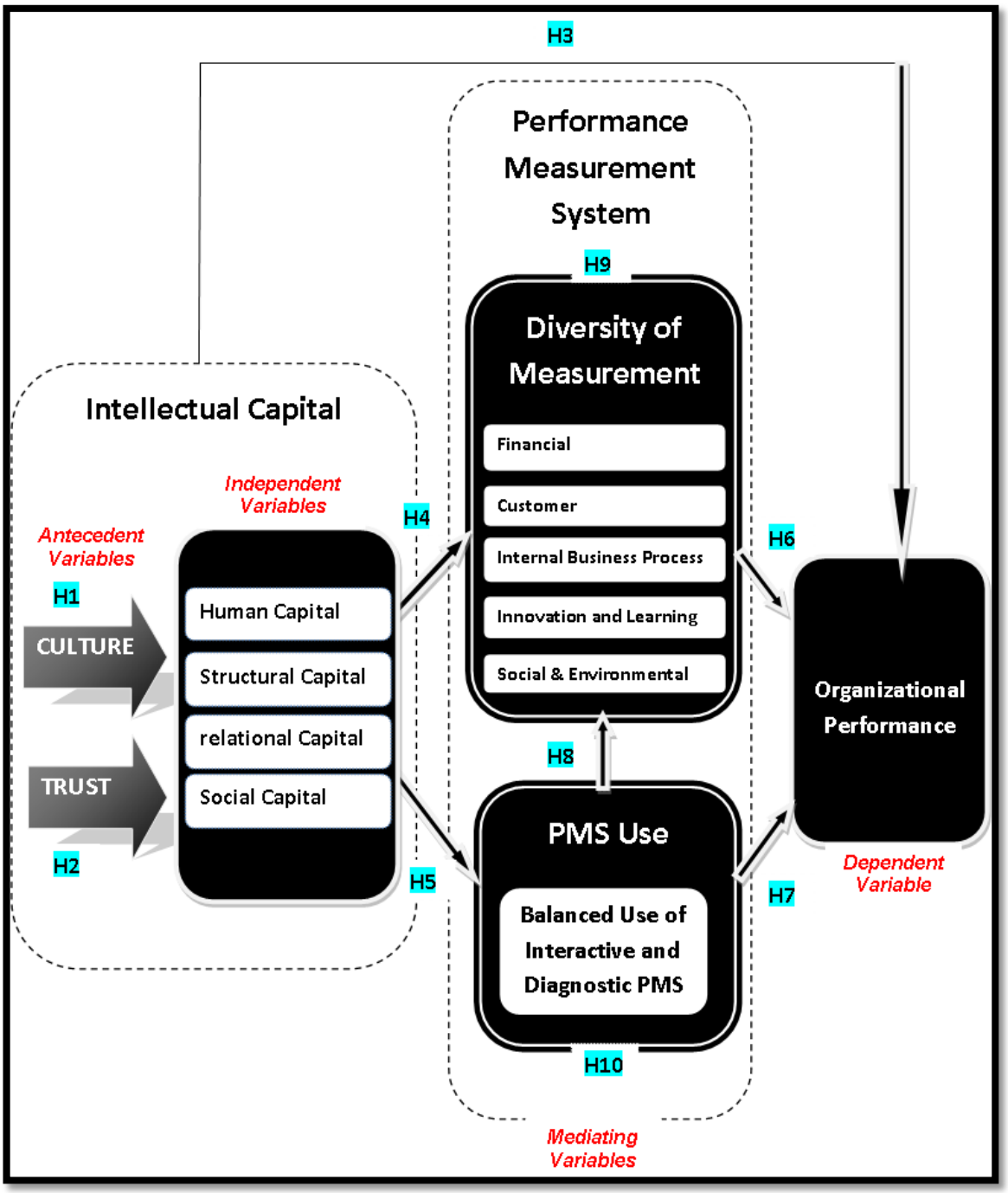


Figure 3.3
Proposed Theoretical Model

3.3 Antecedents of Intellectual Capital

As elaborated in the literature review chapter, this research basically follows the intellectual capital conceptualization introduced by Bontis (1999) in which the two antecedent constructs, trust and culture, play a role as two supporting drivers behind the other Intellectual Capital dimensions (see Figure 3.4). In this regard,

Usoff et al. (2002) suggested that more systematic analysis is required in order to determine which attributes are related to firms which more greatly value the potential implications of IC. More recently, there are some other scholars in the context of IC who are the strong proponents for establishing a model of antecedent conditions which are pivotal to the successful IC development (Bratianu et al., 2011; Isaac et al., 2009; O'Brien et al., 2010).

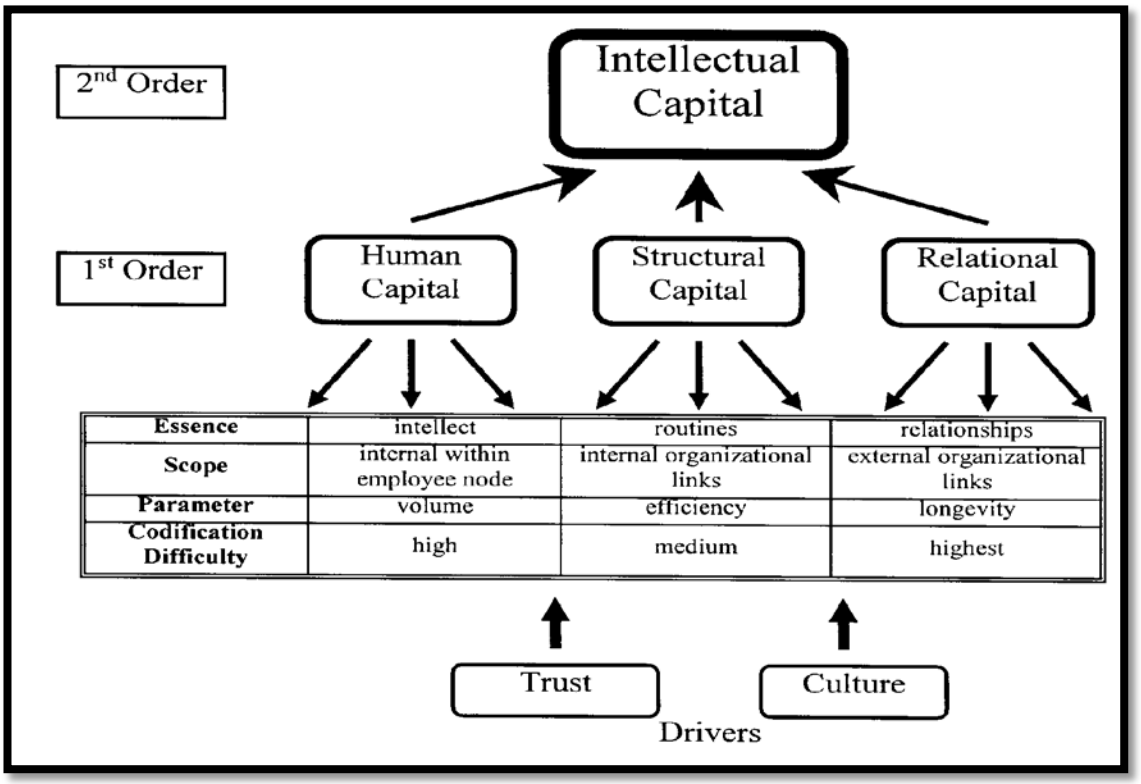


Figure 3.4
IC conceptualization (Bontis, 1999)

3.3.1 Organizational Culture and Intellectual capital

IC forms the basis for the wealth and prosperity of organizations. The ample evidence indicated that knowledge related resources and capabilities bring about radical success in many companies; Buckman Laboratory being one of the best examples (Buckman, 2004). Although the knowledge economy is advocating for changing the way organizations operate, success lies with successful cultural

change. According to Baker (2002), there is a strong indication that the cause of failure when instituting changes (such as TQM and reengineering) is linked to the failure in instigating cultural changes within an organization (Index, 1994; Kotter & Heskett; Pascale & Goss, 1993). For instance, despite the fact that acquiring brilliant human resources and attach too much importance to workforce learning increase the value of organization, reaping the advantages of IC is only viable when organization is able to translate the knowledge of human resources into reusable and sustained functions. This needs a culture through which staff commitment is established, learning is promoted, knowledge sharing is encouraged, and organizational members are participated in decision making (Weston, Estrada, & Carrington, 2007).

With changing work practices, organizations are increasingly faced by the need to change their norms, values and motivation of employees. According to Gottschalk (2004, p.38), an organization's culture forms an impenetrable barrier when it comes to creating and leveraging knowledge assets. David and Fahey (2000) determined that there is a total of four ways where culture is able to effect behaviors that are imperative to the creation of knowledge, its use, and also the act of sharing it. The first way is where culture and its subcultures are forming assumptions about which of the knowledge is worthy of being managed. Second, the link between individual and organizational knowledge is specified by culture, where it determines the individual that is responsible in controlling a specific body of knowledge, who is eligible in sharing it, and who has the right to hoard it. Third is the fact that the context of social interaction (social capital) is heavily influenced by culture, and it also determines the usage of knowledge pertaining to certain situations or settings. Finally, new knowledge and its inherent uncertainties is

created, confirmed and distributed in organization, with the tacit blessing of cultures. According to them, these four perspectives is imperative to managers when they are called upon to assess different cultural aspects that are influential for knowledge related behaviors, which are crucial towards the formation of knowledge-based assets (David, Long, & Fahey, 2000).

Bratianu et al. (2011) posited that the culture of an organization acts as a very strong glue, as it brings together the intelligence of an individual and their respective core values in instigating a culture of excellence. However, it is also acknowledged that it can go completely awry if the core value of an organization is build upon fear or punishments, or if there is a disagreement between the interest of the organization and respective individual values. Organizational leaders who are visionaries always understood the salient role of corporate cultures, thus they worked hard towards the development of a strong and inspirational culture in their respective organizations. Acting as organizational glue, organizational culture is salient in the construction of an intellectual capital that has the potential to innovate (Bratianu et al., 2011).

Literature regarding “organizational culture” is numerous, and there are many authors who prioritize culture as being more than merely the basis of an organization’s success (Nazari et al., 2009). The theory that is mentioned by E. Flamholtz (2002) is in line with this notion, due to the fact that culture is thought of as “an area of essential organizational development, a strategic keystone for a successful company”. Meanwhile, Copeland (2001) regards company culture as imperative to the construction of intellectual capital. In the same vein, literature regarding organizational effectiveness is more and more focused upon the role of

organizational culture towards motivating and maximizing the potential of their respective intellectual assets (Yu & Yanfei, 2008). Mouritsen (2003) argued that culture is pivotal to either effective organizational modification or augmenting the value of IC. Petty and Guthrie (2000) advocates that organizational culture is crucial towards it success, and is capable of increasing intellectual capital within that organization. This is especially true in today's organization, due to the fact that fluctuating environments and k-economy characterizes it, and this requires an impregnable organizational culture in the context of prescribing commonality and behavioral patterns that will inevitably hoard intangible resources that might have been present in the past.

Different kinds of corporate culture would have different impacts on IC. For example, supportive or flexible dominant cultural type could play a big part in fostering the IC (Bontis et al., 2000). In the context of the current study and as stated earlier, control values embody predictability, stability, formality, rigidity and conformity. More specifically, the rationality of culture is reflective towards an orientation prone to efficiency and profit. Heavy emphasis is paid upon factors such as planning, productivity and clarity of the goal. The hierarchical nature of the culture is highly reflective of bureaucracy and its inherent stability, emphasizing roles, rules and regulations (Quinn, 1998). In summary, the types of culture that are linked to control promote rigid control of operations, highly structured channels of communications, and limited flows of information (Burns & Stalker, 1961). Conversely, the value of flexibility generally refers to spontaneity, changes, openness, adaptability and responsiveness. In particular, the culture of development is heavily reliant upon adaptability and the readiness to realize growth, innovation, and creativity. The culture of a group is reflective of cohesion, teamwork, and

morale as conduits that are meant to foster development, empowerment, and unwavering commitment to human resources. In a nutshell, the types of culture that are linked to flexibility are supportive of loose and informal controls, open and lateral channels of communication, and organizational free flow of information (Burns & Stalker, 1961). Such flexible dominant cultural type, as opposed to control culture, is more appropriate in today's knowledge-based environment and is an important driver and enabler to support and guide the intellectual capital management and development (Lynn, 1998). Accordingly, the following hypothesis is put forwarded based on the forgoing discussion derived from the literature:

H1. The greater the flexibility dominant cultural type, the higher is the level of intellectual capital

H1a. The greater the flexibility dominant cultural type, the higher is the level of human capital

H1b. The greater the flexibility dominant cultural type, the higher is the level of structural capital

H1c. The greater the flexibility dominant cultural type, the higher is the level of relational capital.

H1d. The greater the flexibility dominant cultural type, the higher is the level of social capital.

3.3.2 Trust and Intellectual Capital

Leaders in companies devote considerable time and energy endeavoring to establish trust with a variety of stakeholders either within organization (among employees, among managers and employees) or outside the organization such as customers, suppliers, investors, competitors, and affiliates (Pirson & Malhotra, 2008). Are these efforts paying off? Employees who place less trust in a company are supposed to be less loyal, less motivated, and less productive. This also extends to customers, as customers who are wary of a breach of trust will more than likely

approach a competitor in order to safeguard their own interest (Isaac et al., 2010). In a client-supplier relationship, the lack of trust will increase the need for resources devoted to contract enforcement and monitoring, which inevitably increases the cost of transactions (Bigley & Pearce, 1998; MacDuffie, 2010). According to Pirson and Malhotra (2008), organizations that do not manage to keep the trust of their respective investor will more than likely go under. This highlights the importance of the trust of stakeholders in organizations.

Stakeholders are commonly divided into groups, with each group having their own requirements and perspective on things, and managing this different interest group can be quite a challenge. This factor propels the factor of trust in intellectual capital to the forefront of issues that needs to be dealt with delicately. Trust, whether between business and customers, business and supplier, between customers, or internal trust, is deemed crucial to the expansion of a business's intellectual capital (Isaac, Herremans, & Kline, 2010). Bontis (1999) defines trust as sacred towards both inter- and intra-organizational cooperation. For instance, social capital hinges upon trust for many researchers. The social capital (which is characterized by relationships, communities, cooperation, and mutual commitment) would cease to exist without a certain level of trust. That is, social capital would build upon some foundation of trust.

Lin (2007) manage to successfully demonstrate that trust among employees is a central mediating factor, due to the fact that it is directly correlated to their respective willingness to share tacit knowledge, while Gainey and Klaas (2003) discovered the fact that trust is an important antecedent variable regarding client satisfaction in the context of outsourcing training and development, mostly owing

to the presence of tacit knowledge. The lack of trust between coworkers will discourage the sharing of privately held knowledge, rendering it difficult to either create or exploit. This seems to signify that the management of intellectual capital is heavily reliant upon trust (Isaac et al., 2010). Ståhle and Hong (2002), in their argument regarding dynamic IC, corporate change, and self-renewal, seems to suggest that trust is crucial not only between personnel, but it is also significant among leaders and their respective workforce.

Trust is also one of the significant considerations that are taken into account in the context of a learning organization (Ferguson-Amores et al., 2005), especially on the construction of network with the express purpose of knowledge-sharing (Pöyhönen & Smedlund, 2004), while also integrating employees into the decision-making process (Pučėtaitė & Lämsä, 2008). The findings suggest that trust is imperative towards the promotion and creation of intellectual capital, due to the fact that the act of sharing tacit knowledge is critical towards the development of IC. Horwitz, Heng, and Quazi (2003) (p. 27) discusses the practices inside knowledge intensive organizations, and it was suggested that trust is rather significant among other factors, and came up with the conclusion that: “These would turn tacit knowledge within employees to explicit knowledge, which is important in building both intellectual and social capital, accessible by others in the organization”. The lack of trust between co-workers will curtail the sharing of private knowledge, which is indicative of the fact that the creation and subsequent development of IC is incumbent upon great levels of trust. With the foregoing argument in mind, accordingly, the following hypotheses are suggested:

H2. The greater the level of trust, the higher is the level of intellectual capital.

H2a. The greater the level of trust, the higher is the level of human capital.

H2b. The greater the level of trust, the higher is the level of structural capital.

H2c. The greater the level of trust, the higher is the level of relational capital.

H2d. The greater the level of trust, the higher is the level of social capital.

3.4 Intellectual Capital and Organizational Performance Linkage

Shell International ascertained the effect of intangible assets, such as employee satisfaction, organizational culture, environmental and social responsibility on their business strategy, and financial performance (Marr, Gray, & Neely, 2003; Marr, Schiuma, & Neely, 2004). Also, knowledge, which is closely connected to IC, has provided a basis for a firm business performance (Marr et al., 2003), and it is a strategic asset for the firm to improve its sustainable competitive potential (Davenport & Prusak, 1998) and knowledge stocks, flows and creation are directly associated with firm performance (Grant, 1996; Bontis, 1999). Nevertheless, the knowledge-based organizations are not constantly the most profitable. Knowledge will precipitate superior performances if the industry features allow the knowledgeable firm to exploit the advantage of new ideas (Bierly & Daly, 2002). A proper integration of organizations' physical resources and IC can determine both the survival and the performance sustainability of an entity on a long term basis, which managed to fulfill the expectations of its stakeholders – shareholders, creditors, suppliers, customers, communities, manpower, including the whole human race, present and future, and the global community. IC consisting of human, structural, social, and relational capital plays an important part in ensuring the success of organizations during the current century (Roos, Pike, & Fernstrom, 2012).

Nowadays, organizations should be held accountable for their performance for a broad range of clients, from the board of managers to staff, and investors to market regulators. Thus, companies should assure clients that their performance exceed all known expectations. Many scholars asserted that investment in IC leads to an improvement in economic performance (Lev & Sougiannis, 1996; Lev & Zarowin, 1999; Cabrita & Bontis, 2008; Sharabati & Bontis, 2010). This performance is defined by the profitability of operations, which represents a surplus or a margin that is captured due to the difference between the cost of income or production (Bontis et al., 2000). Along the same lines, several researchers observed that IC significantly affects a firm's financial performance (Riahi-Belkaoui, 2003; Youndt et al., 2004; Chen et al., 2005; Tan et al., 2007; Clarke, Seng, & Whiting, 2011). Profitability, which expresses the ability of invested capital in profiteering, is reflective of this financial performance. Based on the resource-based view, Chen et al. (2005) is adamant that IC forms an invaluable resource for a firm's competitive advantage, mainly effective on a firm's financial performance. Moreover, Youndt et al. (2004) posits that knowledge based firms success rates are higher compared to their non-knowledge counterparts, due to the fact that they are more competitive.

To sum up, IC encourages value creation, which in turn leads to superior performance in today's knowledge based economy (Marr et al., 2003). In line with the study conducted by Bollen et al. (2005) and Chen et al. (2005), a direct correlation between the efficiency of ICs and the performance of a firm is expected to be present. Also, according to Edvinsson and Sullivan (1997), IC affects firm performance and, hence, IC should be managed. Thus, the hypotheses are set forth as follows:

H3. The higher the level of **IC**, the higher is the **organizational performance** levels.

H3a. The higher the level of **Human Capital**, the higher is the **organizational performance** level.
H3b. The higher the level of **Structural Capital**, the higher is the **organizational performance** level.
H3c. The higher the level of **Relational Capital**, the higher is the **organizational performance** level.
H3d. The higher the level of **Social Capital**, the higher is the **organizational performance** level.

3.5 Intellectual Capital and Diversity of Measurement Linkage

The standard accounting structure has conventionally offered the model for a firm's performance measurement system. To the degree that the accounting framework is able to provide useful fact and information in relation to the value drivers of a company, it is most effective to derive performance measures directly from the financial statements. The traditional accounting structure was established for organizations which rely heavily upon tangible resources to create value. In today's knowledge-based era, there are several intangible elements that create value which this requires the expansion of new financial and nonfinancial measures. Such new indicators support managers in specifying how effective a firm has been in increasing the optimal use of rare assets and in meeting their strategic objectives pertinent to those intangible elements (Amir & Lev, 1996). That is, it is difficult to manage what you do not measure. According to Usoff et al. (2002), performance measures must be augmented for the purpose of supporting the appraisal of the use of IC to achieve strategic goals. In this respect, several researches (Edvinsson & Malone, 1997; Ittner & Larcker, 1998; Widener, 2006; Tayles et al., 2007) have

demonstrated that non-financial indicators are more significant within sectors where the key success factors are related to intangible resources. Organizations which realize the importance of IC are likely to better realize the significance of disclosing nonfinancial measures of performance in order to measure success in meeting their business model targets (Usoff et al., 2002). Accordingly, such organizations may tend to be better in possessing more developed performance measures thereby allowing the evaluation of incremental changes in IC.

As explained before, in order to mitigate the problems regarding financial-only measures, varying performance measurement mechanisms, with a broad set of financial and nonfinancial measures were suggested in the early 1990s (Mike Bourne et al., 2000). Such approaches prioritize intangible resource (Amir & Lev, 1996), represented by key customers, internal processes and learning (Simons, 1990). For instance, Intangible Assets Monitor (Edvinsson & Malone, 1997), or Skandia Navigator (Sveiby, 1997), has been specially established with the purpose of accommodating intellectual capital, as well as Balanced Scorecard (BSC) (Kaplan & Norton, 1996; Lipe & Salterio, 2000) which is strongly oriented towards strategy. It has recently been argued that such mechanisms are able to determine intellectual capital elements, although the objective originally was to assist and plan strategy with a basic consultancy orientation (Kaplan & Norton, 2004). In this regard, for example, Value Chain Scoreboard (Lev, 2001) is systematically intended to reflect the influence of intangibles on firm performance and effectiveness, and is employed by either managers or shareholders.

In today's information era, PMS should be furnished with multidimensional indicators and more diversity of measures for the purpose of effectively managing

the critical success factors, (Kaplan & Norton, 1996; Widener, 2006). For instance, BSC models are implemented by numerous companies which consist of measures across a wide set of organization functions. In this respect, economic theory and in particular the informativeness principle also proposes that organizations would put value on multiple and a broad set of measures as long as the measure provides information beyond that contained in traditional financial measures (Feltham & Xie, 1994; Widener, 2006). Hence, organizations put emphasis on non-traditional approaches which include more diversity of measures (e.g., customer, internal business process, learning and growth, and financial) in their performance measurement system irrespective of which strategic resource, mainly include human, structural, relational, and social capital, the firm relies on, (Kaplan & Norton, 1996). Given the fact that the vast majority of these multidimensional performance measures have been developed for the purpose of assessing intellectual capital (Tayles et al., 2007), it can be expected that knowledge intensive organization, which possess broader scope of IC including human, structural, relational, and social capital, would likely place a high value on these recently developed models with more diversity of measures, including a broad set of financial and nonfinancial indicators, in order to take full advantage of such intangible resources. This lends credence to the assumption stating that companies with large scopes of IC tend to use a broad set of financial and nonfinancial measures, and greater measurement diversity involving balanced, multi-dimensional measures. Hence, drawing from all abovementioned remarks the following hypotheses are put forwarded:

H4. The higher the level of **Intellectual Capital**, the higher is the **diversity of measurement**

H4a. The higher the level of **Human Capital**, the higher is the **diversity of measurement**.

H4b. The higher the level of **Structural Capital**, the higher is the **diversity of measurement**.

H4c. The higher the level of **Relational Capital**, the higher is the **diversity of measurement**.

H4d. The higher the level of **Social Capital**, the higher is the **diversity of measurement**.

3.6 Intellectual Capital and the Balanced Use of PMS

As discussed in the previous chapter, the joint or balanced use of PMS diagnostically and interactively is necessary for managing inherent organizational tensions (Henri, 2006a). According to Lewis (2000), balanced use of PMS represents contradictory but interrelated elements. In this regard, English (2001) defined tension as "the two phenomena in a dynamic relationship that involve both competition and complementarity". Balanced or joint use of PMS in a diagnostic and interactive way engenders competition (positive against negative feedback) and complementarity (focus on intended and emergent strategies). Such countervailing force is not inevitably new-found concern within the academic literature, and is associated with other concepts such as conflict, paradox, dilemma, and contrast (English, 2001). For example, some scholars have investigated the paradox about the tendency towards risk taking and creative activities while concurrently implementing a safe and incremental accomplishment (Cameron, 1986). In a similar vein, other scholars, among others, Barrett & Fraser, 1977; Chenhall, 2004, addressed conflicts in relation to using and employing of control and cost systems. According to the conflict literature, tension would probably be advantageous to entities and it is not inevitably adverse (DeDreu, 1991; Nicotera, 1995). Although conflict and tension were characterized as being disruptive and averse by some

basic premises, there is ample empirical evidence from the conflict literature which advocate the notion that tension, perhaps, be positive to either individual or corporate performance. This implies that innovation, decision quality, product development, and communication are weakened where the tension is prevented and suppressed (DeDreu, 1991; Nicotera, 1995). Balanced use of PMS fosters dialogue, encourage innovation, and focus organizational attention within company (English, 2001; Henri, 2006a; Tjosvold, 1997; Van Slyke, 1999). These three factors are developed through the integrating the interactive and diagnostic use which seems more appropriate control system style in knowledge-intensive organizations with more intangible resources.

As explained earlier, using PMS interactively promotes opportunity seeking and encourages dialogue, whereas using PMS diagnostically imposes limitations and secures compliance with orders. According to Henry (2006a, p. 537), the balanced use of diagnostic and interactive uses has two effects: (i) ensuring that positive effects of interactive use on capabilities will be achieved; and (ii) expanding these positive effects of interactive use. In some situations, the potential advantages of interactive use could vanish in the wake of inadequate diagnostic use to specify borders and to underscore problems pertinent to effectiveness. This in turn may leads to a deviation from the normal direction, wasted energy and an interruption of continuity (Cameron, 1986; Chenhall & Morris, 1995). Likewise, employing diagnostic control excessively, which inherently limits creativity and risk taking, may undermine the potential advantages of interactive use. This in turn may result in stagnation, loss of energy and declining morale (Cameron, 1986; Chenhall & Morris, 1995).

The countervailing positive force derived from the joint use of PMS diagnostically and interactively fosters dialogue within entity (Dent, 1987). It offers the chance to communicate and interact in a dialectical manner through allowing to argue vigorously opposing positions (Chenhall, 2004). In particular, balanced use offers precious data which positively influence flexibility, creativity, and effectiveness. Besides, it augments constant interactions with regard to strategic challenges and boosts mutual understanding. Further, it supports open, vigorous, and energetic arguments, and assists organizational members in developing their ideas and actions (Amason, 1996; De Dreu, 1997; Tjosvold, 1997). Also, innovation is fostered by balanced use of PMS, which leads employees to combine apparently opposite factors (VanSlyke, 1999). As Chenhall (2004) argued, it provides insight about viable alternatives of doing things through supporting the recognition and integrates of various perspectives. Lastly, using the balanced PMS diagnostically and interactively supports focusing organizational attention. In fact, such integration makes major problems explicit and assists teams to specify their boundaries, thereby increasing the motivation and power for addressing serious challenges. According to Henri (2006a), balanced use of PMS is capable of promoting involvement and empowerment through offering incentives for various teams to join forces toward mutual targets.

To conclude, management accounting literature shows that there is much variability in the nature and the extent to which organizations implement PMS. Lee (1999) asserted that more than 50% of CFOs surveyed contended that one of the major impediments to organizations' success is attributed to their inability to develop a systematic and robust PMS. According to Usoff et al. (2002), it is possible that the difference is associated with a firm's attitude towards intellectual

capital. It is argued that organizations which realize the importance of intellectual capital will have employed a robust and systematic PMS to a greater extent for the main purpose of taking full advantages of such intangible assets (Usoff et al., 2002). According to Henri (2006a), addressing performance measurement system from two opposite but complementary aspects simultaneously could provide a more systematic and robust performance measurement system. A balanced use of PMS in a diagnostic and interactive mode produces countervailing positive forces which in turn promote organizational dialogue, creativity, decision quality, product development and focus organizational attention (Amason, 1996; Tjosvold, 1991; DeDreu, 1991; English, 2001; VanSlyke, 1999). Henri (2006a) asserted that a balanced use of PMS in a diagnostic and interactive fashion, as a more robust and systematic PMS, is able to foster the intellectual capabilities such as market orientation, entrepreneurship, innovativeness and organizational learning. In effect, there is a natural fit between the requirements of such intellectual capabilities and such organic use of control systems i.e. balanced use of PMS (Chenhall & Morris, 1995; Van de Ven, 1986). With this discussion in mind, it is plausible to conclude that regardless of which intellectual capital (in terms of human, structural, relational, and social capital) the company relies on, knowledge-intensive organizations with more intangible resources and IC tend to employ the balanced use of PMS to a greater extend in order to take full advantage of those strategic resources in today's knowledge-based economy:

H5. The higher the level of **IC**, the higher is the balanced use of diagnostic and interactive PMS.

H5a. The higher the level of **human capital**, the higher is the balanced use of diagnostic and interactive PMS.

H5b. The higher the level of **structural capital**, the higher is the balanced use of diagnostic and interactive PMS.
H5c. The higher the level of **relational capital**, the higher is the balanced use of diagnostic and interactive PMS.
H5d. The higher the level of **social capital**, the higher is the balanced use of diagnostic and interactive PMS.

3.7 Diversity of Measurement and Organizational Performance Linkage

Generally, the non-financial perspective is the most considered part among other aspects of multidimensional PMS. Previous studies have observed that the use of this type of measures resulted in increased organizational performance (Hoque, 2004; Hoque & James, 2000). For example, Ruzita Jusoh, Ibrahim, and Zainuddin (2008) found that BSC measure's adoption is significantly associated with firm performance in Malaysia, asserting that the more extent of BSC adoption brings about the greater firm performance. Likewise, Said, HassabElnaby, and Wier (2003) chose two groups of companies that one of them employing nonfinancial performance measures in managerial bonus plans and another one employing merely financial measures. They observed that there is a significant positive association between the use of non-financial measures and current market-based returns and future accounting- and market-based returns. As Stede et al. (2006) discussed, there is a difference among objective and subjective nonfinancial indicators. They found that more frequent and greater diversity of performance measures employed by manufacturing firms have more effect on the superior performance — specifically when larger numbers of objective and subjective nonfinancial measures embedded in their system.

Besides, other studies have been paid attention to the impact of employing a broad set of financial and nonfinancial performance measures within a balanced or multiple frameworks. For instance, based on a work of Banker et al. (2000), archival data of 18 hotels had been analyzed for a six-year period managed by a large U.S. hotel chain. Meanwhile, hotels implemented a multi-dimensional PMS. Interestingly, they found improvements in either customer satisfaction or profitability. In fact, augmented profitability was not attributed to increased room rates; rather it was stemmed from higher revenues which in turn flow from augmented occupancy (a strategic objective). Along the same lines, Davis and Albright (2004) investigated the implementation of a multi-dimensional PMS and its performance consequences within a single banking organization in the US. They observed that the financial performance was significantly increased within those branches that employed the multiple PMS (as opposed to the non-adopting control branches). In the same vein, Hoque and James (2000), in a study of 66 Australian manufacturing firms, contended that there is a positive association between the firm performance and wider usage of a balanced or multi-dimensional performance measures.

Accordingly, drawing from forgoing ample evidences in the Western context, it can be observed generally the positive performance consequences of adopting more diversity of performance measures and integrated financial and non-financial approaches as well. Notwithstanding the plausibility of a similar linkage among Iranian organizations, there are a few empirical evidences found in relation to this association. Therefore, the following hypothesis is suggested:

H6. The higher the **diversity of measurement**, the higher is the **organizational performance**.

3.8 Balanced Use of PMS and Organizational Performance Linkage

Even then previous works have investigated the association between MCS in general and PMS in particular, and performance employing a premise of fit to the context of the firm (Govindarajan, 1988; Govindarajan & Fisher, 1990; Perera, Harrison, & Poole, 1997; Sim & Killough, 1998), and although another stream of literature has indicated a significant correlation between the design of PMS (emphasizing a broader set of financial and non-financial information) and performance (e.g. Scott & Tiesen, 1999; Hoque & James, 2000; Davila, 2000; Baines & Lang- Field-Smith, 2003; Said et al., 2003; Jusoh et al., 2008), the precise nature of the linkage between the use of PMS and performance remains ambiguous (Henri, 2006a). However, it has been contended that the certain use of PMS has the potential to contribute to both individual and organizational performance (Simons, 1995; 2000). More recently and drawing upon resource-based logic (RBV), Henri (2006a) found that using the balanced PMS diagnostically and interactively influences organizational performance positively.

Employing PMS in an interactive mode opens up channels of communication among leaders and their employees. This in turn brings about precious sources of idea and knowledge, include involvement in innovative activities to arrive at a solution to recognize issues and grasp potential opportunities. Using PMS interactively appears to inspire human resources to accomplish objective directed behavior, offer them with a voice, increase positive attitude to managers and functions, and could be utilized to focus attention concerning problems which influence effectiveness, such as strategic uncertainties (Bisbe et al., 2007; Libby, 1999; Lind et al., 1990; Simons, 1994b). These effects derived from the interactive

use of PMS have the power to augment performance. The involvement of top managers in an interactive control setting takes the form of non-invasive participation via constant interventions. This is oriented toward a facilitating, synthesizing and fostering kind of participation which is eventually seek performance enhancement (Bisbe et al., 2007). Employing an interactive PMS implies that the PMS would be utilized intensively by senior and middle-level managers. The dominance of the constant dialectical discussion offers employees with data which support them in aligning their functions with their objectives (Ilgen, Fisher, & Taylor, 1979), which consequently improve performance. Besides, the frequent communication with top managers would provide middle-level managers with relevant data regarding their work role, which could augment effectiveness as well (Kerr & Slocum, 1981). Feed-forward intensive data could also be utilized for managing promising performance. This data could be provided from the intensive interactions among leaders and their employees via the use of PMS interactively. Besides, innovation is at the heart of interactive approaches and the management literature highlights the importance of innovation as one of the central drivers of lasting firm performance in modern setting (Bisbe & Otley, 2004; Clark, 1991; Kanter, 2001; Walsh, Roy, Bruce, & Potter, 1992).

To sum up, from the lens of resource-based logic, it is plausible to conclude that the balanced PMS use diagnostically and interactively is able to affect performance positively (Henri, 2006a). Henri asserted that, an effective integration between diagnostic and interactive use could be regarded as a capability. In this respect, the capacity to achieve a balance between two countervailing uses of PMS which, at the same time, attempt to inspire creativity and innovativeness while trying for predictable achievements reflects a capability which can be labeled as

valuable, distinctive, and imperfectly imitable. Such aptitude to handle the integration of diagnostic and interactive use relying upon a variety of inside and outside elements is complex and may not be readily transferred. These arguments provide the foundation to put forward a relationship between this balanced use of PMS and firm performance.

H7: The greater the balanced use of interactive and diagnostic PMS, the higher is the **organizational performance**.

3.9 Relationships between Balanced Use of PMS and Measurement Diversity

As explained earlier, monitoring use which necessarily implies diagnostic nature signifies two primary attributes related to mechanistic controls: the first reflects tight control of operations and strategies, and the second reflects highly structured channels of communication and restricted flows of information (Burns & Stalker, 1961). A diagnostic use of PMS embodies a cybernetic perspective. Either financial or non-financial indicators could be employed in a cybernetic mode. Nevertheless, it is discussed that a diagnostic style is likely related to the higher use of financial information, in contrast with non-financial measures. This implies that a diagnostic PMS fashion per se does not seem likely to require greater diversity of performance measures due to the fact that it tends to focus largely on financial – only measures. Normally, financial data is significantly associated with a conventional planning and control cycle where results are compared to predetermined standards to detect discrepancies and rectify deviations. According to Johnson and Kaplan (1987), financial accounting information is the central focus of traditional PMS. As Nanni, Dixon, and Vollmann (1992, p. 13) noted: ‘‘They [planning and control] are by nature integrated into a whole, but traditional

accounting-based planning and control methods artificially separate them into a future desired ‘state’ in financial terms, and periodic checking to see whether that financial state is being approached at the planned rate’’ (Nanni, Dixon, & Vollmann, 1992).

On the other continuum, interactive style reflects two major characteristics related to organic controls. The first is loose and informal control involving norms of cooperation, communication and focus on getting things done. The second reflects open channels of communication and free flow of information throughout the organization (Burns & Stalker, 1961). More specifically, interactive PMS style is oriented towards providing signals and promoting communication throughout the organization. Financial information reporting negative variances against initial expectations can be used to focus attention and trigger discussion when the results are published. Vandenbosch (1999) noted that these arguments could bring about corrective action. Previous research reported many strong points of non-financial indicator. They encompass greater predictive power, being more directly traceable to strategic actions, more actionable and more opportune than financial measures (Ittner & Larcker, 1998). Therefore, non-financial information is able to foster dialogue and argument all over the company, promote attention focusing on strategic priorities and uncertainties, and further the learning and the advent of novel strategic patterns. Following such strengths such as being more traceable to strategic actions and more actionable, these indicators could be employed in a forum to inspire discussion, dialog, insights, and new action plans. Henri (2006a) indicated that the joint use of interactive and diagnostic PMS reflects an effective way towards promoting market orientation, innovativeness and organizational learning. Since these elements and concepts such as learning and innovation lie at

the heart of multidimensional performance measures, it can be predicted a natural fit between the requirements of the use of more multiple measures and such balanced use of control systems which implies more measurement diversity. Plausibly, it is self-evident that a dual function of PMS with a wider scope which includes both interactive and diagnostic requires both financial and non-financial measures with a broader extent of diversity. Formally stated:

H8: The greater the **balanced use** of interactive and diagnostic PMS, the higher is the **diversity of measurement**.

3.10 Mediating Role of PMS in the IC and Performance Relationship

Although numerous studies focusing on performance and valuation have proved a positive impact of intellectual capital on firm's market value (Chen et al. 2005; Choi et al. 2000) and financial performance (Wang & Chang 2005; Chen et al. 2005; Youndt & Snell 2004; Bontis et al. 2000), some reveal a negative relationship as well. Huang and Liu (2005) who studied the association among innovation, IT, and performance showed a nonlinear association between innovation capital and business performance. Firer and Williams (2003) detected a negative relationship between human capital and VAIC measure within the South African context. On the other hand, some other studies revealed that there is no association between specific components of IC and performance (Chen et al. 2005; Fernandes et al. 2005). These findings could plausibly suggest that some of the advantages (e.g. performance improvement) from the intellectual capital may affect corporate performance indirectly through the emphasis put on some other variables such as PMS.

Performance measures can play a prominent role in managing the business and its fundamental strategic resources through providing relevant and vital information for managers (Widener, 2006). The well-known proverbial expression "if you can't measure it, you can't manage it" (Kaplan & Norton, 1996, p. 21) or put differently, "you can't manage what you can't measure" assumes that business performance would be positively influenced by the measurement of the organization's fundamental critical success factors such as strategic capacities and assets. Proposed theoretical model summarizes this assumption by depicting that although the level of IC and organizational performance are associated directly and positively (H2), the role of performance measurement system is able to intervene in that association. According to Widener (2006), once organizations acquire their strategic resources/capabilities, performance measurement system would be employed in order to assist in the capturing and managing such vital resources. Then, the providing useful feedback and information on that fundamental capital, which aimed at supporting entity in exploiting the strategic resource effectively, in turn leads to performance improvement. This implies that some of the advantages stem from the intellectual capital would influence firm performance indirectly through the emphasis put on the usage of PMS.

Ample empirical evidence lends support to the existence of such indirect association (Chong & Chong, 1997; Gul, 1991; Gul & Chia, 1994; Joiner, Spencer, & Salmon, 2009; Jusoh, 2008; Mia, 1993; Mia & Clarke, 1999; Widener, 2006). For instance, Mia and Clarke (1999) found the mediating effect of management accounting information between the association of market competition and business unit performance. That is, market competition is capable of influencing performance by the providing of information. They believed that organization is

able to position itself correctly in the marketplace and counteract competitive threats through vital information provided by management accounting information. In a similar vein, Baines and Langfield-Smith (2003) examined management accounting change and observed that firm performance is affected positively by changes in organizational design, technology and advanced manufacturing practices through changes in non-financial management accounting information. Therefore, a PMS is developed by entities to deploy performance measures for the purpose of providing vital information for top managers concerning the organization's underlying resources and capabilities (Simons, 2000), which in turn will positively impact performance (Kaplan & Norton, 1996; Lev, 2001). Similarly, Jusoh (2008), found that the association among external environment and organizational performance could be mediated partially by multi-dimensional performance measures (such as BSC) usage within companies. Most relevantly, in relation to the context of this study and drawing from the resource-based view, Widener (2006) found a significant mediating role of the importance of performance measures usage between the importance of strategic resources and performance, and therefore, that performance measures matter. Furthermore, Joiner et al. (2009) observed that PMS which characterized by both financial and non-financial performance measure mediates the relationship between the flexible manufacturing strategy and organization financial and non-financial performance. More recently, Hammad, Jusoh, and Oon (2010) have suggested a framework based on the contingency theory in which the extent of use of management accounting information plays a significant intervening role between organizational strategy, technology, organizational structure, external environment, and hospital size, on managerial performance.

Hence, as mentioned at the outset of this section, notwithstanding the direct relationships outlined before (IC and PMS, and PMS and organizational performance), it can be also hypothesized that, an indirect path between IC and organization performance through the appropriate use of PMS. That is, it is expected that knowledge-based organizations with the high level IC will put emphasis on more innovative PMS (balanced use of interactive and diagnostic) and greater use of measurement diversity as well. In turn, PMS characterized by more innovative characteristics are likely to be associated with enhanced organization performance because such techniques are less narrowly focused and enable managers to focus on the strategic components of organization performance such as customer responsive flexibility (Joiner et al., 2009). Thus, it is proposed these two variables (IC and performance) are probably connected via appropriate use of PMS in terms of both PMS use and diversity of measures as well. H9 and H10 are hypothesized based on the premise that organizations evaluate their potential in terms of fundamental critical resources/capabilities and then deploy appropriate PMS which are aligned with those resources which in turn bring about performance improvement.

H9: **Diversity of Measurement** mediates the relationship between **intellectual capital** and organizational performance.
H9a: **Diversity of Measurement** mediates the relationship between **human capital** and organizational performance.
H9b: **Diversity of Measurement** mediates the relationship between **structural capital** and organizational performance.
H9c: **Diversity of Measurement** mediates the relationship between **relational capital** and organizational performance.
H9d: **Diversity of Measurement** mediates the relationship between **social capital** and organizational performance.

H10: **Balanced Use of PMS** mediates the relationship between **intellectual capital** and organizational performance.
H10a: **Balanced Use of PMS** mediates the relationship between **human capital** and organizational performance.
H10b: **Balanced Use of PMS** mediates the relationship between **structural capital** and organizational performance.
H10c: **Balanced Use of PMS** mediates the relationship between **relational capital** and organizational performance.
H10d: **Balanced Use of PMS** mediates the relationship between **social capital** and organizational performance.

3.11 Summary

This chapter started with addressing the gaps of the research in details drawing from the literature review in chapter two. The chapter then presented the conceptualization of the proposed theoretical model relying heavily upon the resource-base view and contingency theory as well as the basis for hypotheses development. The central focus of the hypotheses development is on building the relationship among the research's antecedent variables (i.e. organizational culture and trust), independent variables (i.e. human, structural, relational, and social capital), mediating variables (i.e. diversity of measurement and balanced use of PMS), and independent variable (i.e. organizational performance).

CHAPTER FOUR
METHODOLOGY

4.0 Overview

As demonstrated in the previous chapter (chapter three), the theoretical framework and hypotheses were developed mainly according to the relevant IC and PMS literature in chapter two and also research questions which were posed in that chapter. Broadly speaking, the central focus of this chapter is to describe the methodology that was utilized in order to test the hypotheses generated from theoretical model which established in the previous chapter. Accordingly, the research design including the measurement of the research variables, the questionnaire design, the procedures of sampling and data collection, and techniques of analysis used for the purpose of testing the research hypotheses is elaborated in this chapter. More specifically, the research design which itself includes the research paradigm, research approach, and the research methodology respectively are discussed at the outset in section 4.1. This is followed by the description of the research's variables measurement, namely antecedent variables, independent variables, mediating variables, and dependent variable in section 4.2. Section 4.3 is the discussion on the way that in which the questionnaire was designed and developed for the purpose of this survey. Moreover, the process of pre-testing and its results are presented in this section. Section 4.4 explains how to select the sample for the current study. Subsequently, section 4.5 specifies and overview the data analysis techniques used in this study. Finally, the chapter closes

with a brief synopsis entitled as 'chapter summary' in section 4.6. Overall, the current study uses questionnaire survey for the purpose of gathering cross-sectional data from Chief Financial Officers (CFOs) of all companies within the Tehran Stock Exchange (TSE) in Iran. The questionnaire was sent through mail (postal survey). Also, data obtained in this research were analyzed applying Partial Least Squares - Structural Equation Modeling (PLS-SEM) technique.

As can be seen, the two following figures provide a comprehensive and clear overview regarding Research methodology (Figure 4.1) and also research plan (Figure 4.2) of the current study.

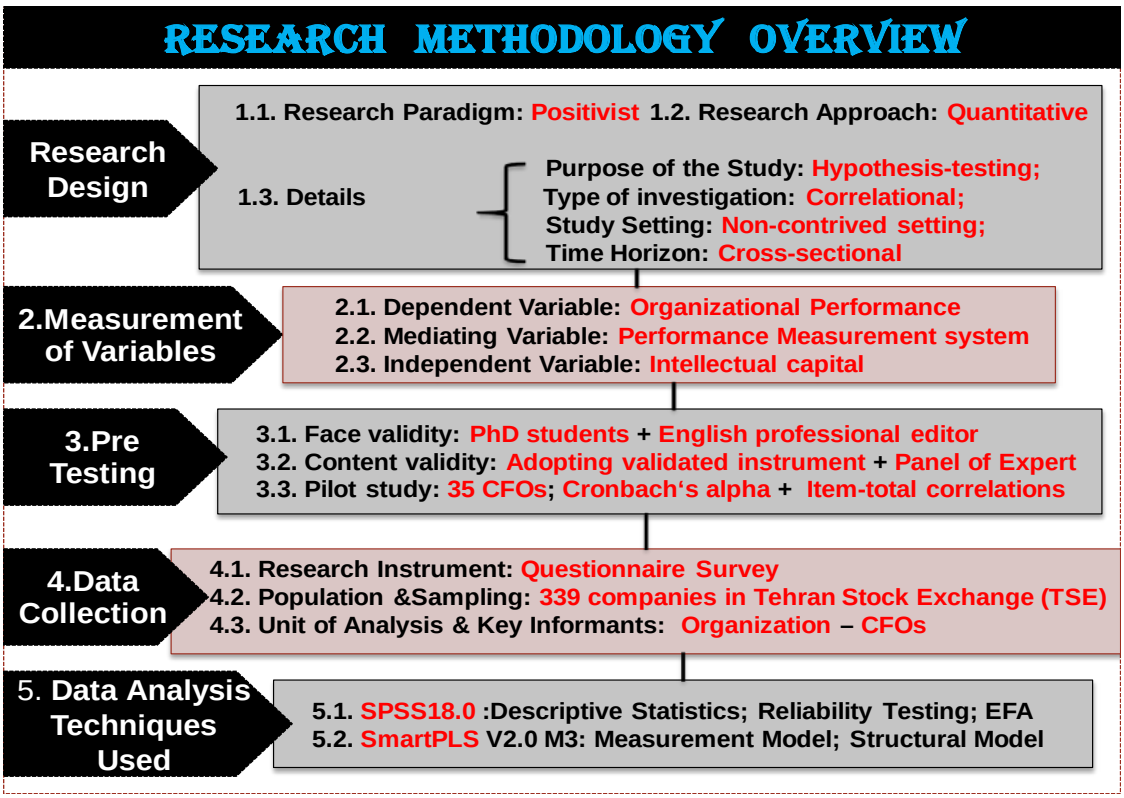


Figure 4.1
Research Methodology Overview

Zikmund (2003) defines research plan as a master design through which the techniques and procedures for gathering and analyzing the desired data are specified. The main purpose is to make certain that data collected is really suitable

for addressing the issue (Zikmund, 2003). In the same vein, Cooper and Emory (1995) enumerate three reasons and objectives for developing the research plan. First, it offers a comprehensive design to select sources and kinds of data which is utilized to deal with the main research concern. Second, research plan clarifies the association among the variables of interest in a study and lastly, research plan enables the researcher to argue and interpret the development of hypotheses and the data analysis.

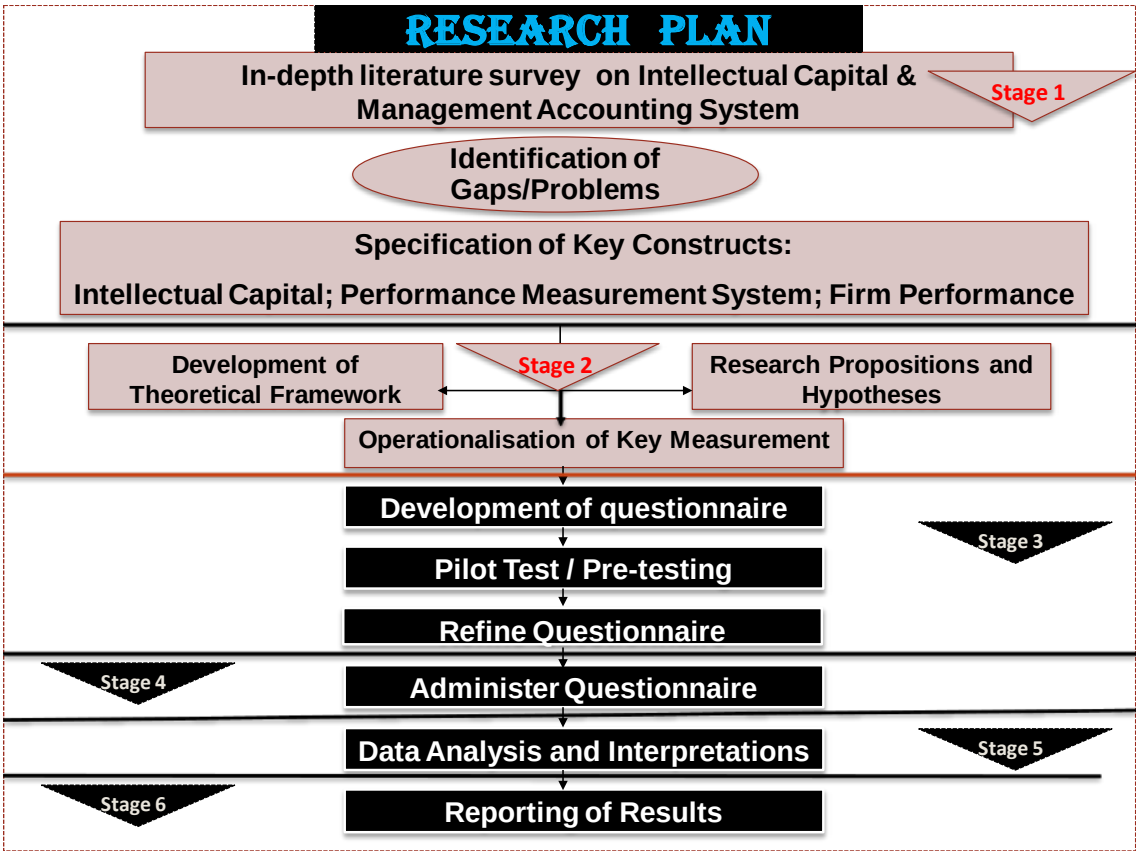


Figure 4.2
Research Plan

4.1 Research Design

In order to carry out research as well as handle information, a prudent researcher is supposed to cautiously choose a suitable underlying assumption or so-called research paradigm, an appropriate research methodology, and a set of

methods to collect and analysis the data. Some scholars propose procedures to adopt the appropriate research design. Sarantakos (1998), among others, put forwarded three related phases i.e. choose a suitable paradigm, decide on a methodology, and finally select a set of methods. In line with the foregoing procedures, this research has been specially designed in three phases, namely adopting a research paradigm, deciding on an approach (quantitative versus qualitative), and choosing a methodology.

4.1.1 Research Paradigm

Before selecting the study approach, there is a necessity for addressing the underlying assumptions regarding how to comprehend knowledge and how to acquire it. Iivari, Hirschheim, and Klein (1998) have suggested a broadly acknowledged paradigmatic model that embraces four main paradigmatic assumptions:

- Ontology represents the structure and properties of what is supposed to exist.
- Epistemology refers to the essence of knowledge and how knowledge could be acquired.
- Research methodology embodies the procedures or research methods which are employed for gaining knowledge.
- Ethics signifies assumptions concerning the responsibility of a researcher towards the outcomes and effects of his or her research approach and its findings.

Relying upon epistemological assumptions or so-called underlying assumptions regarding how knowledge could be acquired, Chua (1986) suggested three classifications, namely positivist, interpretivist, and critical. Whether or not

there is a possibility that these three paradigms could be adopted separately or in combination is arguable. Alternatively, Iivari et al. (1998) differentiate positivism from anti-positivism.

This study intends to examine universal laws in relation to social phenomena, i.e. linking Intellectual Capital and Performance Measurement System to Organizational Performance. Hence, this research is classified under the positivist paradigm. A positivist scholar perceives the social world as the world of natural phenomena. That is, it is believed that social fact such as attitudes, satisfaction, beliefs and norms would be objectively measured by means of the adoption of conventional scientific techniques through independent observers (outsiders). With this discussion in mind, the current research typically applies quantitative measurement and statistical analysis. According to Chua (1986), for mainstream accounting research (or considered as positivist), there is evidence of formal propositions, objective measures of variables, hypothesis testing, and the drawing of inferences about a phenomenon from the sample to a stated population.

4.1.2 Research Approach

Research approaches are typically classified as both quantitative and qualitative (Neuman, 2005). The quantitative approach is described as the scientific empirical tradition, while the qualitative approach is known as naturalistic phenomenological approach (Burns & Bursn, 2000). As Yauch and Steudel (2003) argued, the suitability for employing quantitative or qualitative approaches hinges upon a specific research paradigm or a set of assumptions. According to Chua (1986), quantitative approach is typically applied when the paradigm is positivist, while qualitative approach is used in the case of interpretive paradigm traditionally.

Crotty (1998) asserted that the difference between quantitative and qualitative approaches cannot be explained at the level of epistemology, or theoretical perspectives. Instead, the distinction takes place at the level of methods, or type of data used. He also argues that method is a technique or procedure which is applied for the purpose of collecting and analyzing data.

Likewise, concerning the data presentation, as Yauch and Steudel (2003) argued, quantitative approach such as surveys or other measurements generate data in the shape of numerals, while qualitative perspective (e.g. interviews, focus groups or participant observation) gather individual words. The quantitative perspective is built upon a scientific technique for data gathering and analysis in statistical method, an approach rooted in objectivism or so-called positivism. The quantitative perspective is generally oriented towards addressing 'what' and 'how', as well as specifying the frequency and percentage of observations. That is, quantitative technique is concerned with obtaining objective or numerical data which could be charted, graphed, tabulated, and analyzed applying statistical techniques. The quantitative perspective is oriented towards deductive reasoning. Deductive reasoning commences with a general theory and concludes with particular observations. On the contrary, in inductive reasoning, a researcher is not affected by previous theories but instead intends to establish new model relying upon observable evidence. In deductive reasoning, a researcher is able to specify what theories can describe the data in advance. The conventional quantitative method is the questionnaire survey. In this technique, the questionnaires are sent to the stratified or random sample of the population via mail, face-to-face, or nowadays via the Internet. According to Myers (1997), there are some other

prevalent methods such as laboratory experiments, formal techniques like econometrics, as well as statistical techniques like mathematical modeling

Qualitative approach was not adopted for this research for following reason. First and foremost, qualitative perspective is more suitable in the preliminary stages of research (exploratory research) as well as for establishing theory. In this respect, the current study is oriented towards a confirmatory research in which some related theories were developed previously. Secondly, this study is not aimed at interpreting what has been observed, reported or registered into written words. Lastly, qualitative study has a propensity to rest upon comprehensive and detailed explanations of events, individuals or firms and they are commonly related to small-scale studies. Conversely, this study is oriented towards quantitative approach for the following reasons. First and foremost, in the context of this research the theory was already developed and hence it intends only to examine the existing theory. Secondly, this study aims to quantify associations among variables of interest with the intention of developing and testing hypotheses derived from theories which possibly will be either accepted or rejected based on statistical results and analyses.

4.1.3 Research Methodology

As mentioned earlier, this research is aimed at testing a number of hypotheses and investigate the hypothetical associations among Organizational Culture, Trust, Intellectual Capital (IC), Performance Measurement System (PMS), and Organizational performance (OP). In hypothesis testing study, the hypothetical associations are examined in order to find an answer to the hypothesis. According to Sekaran and Bougie (2010), the rigor of a methodology increases when

researcher moves towards a hypothesis-testing study from an exploratory research. As such, this study is perceived as a correlational research since the researcher is interested in explaining the effect of some antecedent variables, namely Culture and Trust on IC, as well as the impact of IC on PMS and OP among Iranian companies. A correlational association states that two constructs or variables move simultaneously. A correlational research is adopted when the association among the variables or concepts is taken into consideration.

Subsequent to specifying the purpose of the current study as well as the type of investigation, the next phase is to determine the research method to be utilized. When the framework of the study indicates a wide understanding of the concepts, the purpose of the research is supposed to be outlined as research hypotheses. Hence, the researcher is more involved in investigating the relationship between the variables of interest and would employ the hypothesis-testing approach such as field research and structured surveys. This study is mainly conducted to scrutinize the effect of IC on PMS and OP, and therefore the research adopts the hypothesis testing research approach.

According to Cavana, Delahaye, and Sekaran (2001), business research could be carried out within the natural context where work goes on normally, that is to say in a non-contrived setting. Those researches which intend to explain correlational associations are typically undertaken within a natural setting in which individuals are normally functioning. Accordingly, the current study is carried out in the non-contrived settings of public listed companies in Iran. In order to achieve the research purposes, research could be embarked on wherein the needed information are gathered only on one occasion maybe during a few months or

several weeks or days. These types of researches are labeled as cross-sectional or so-called one-shot research (Cavana et al., 2001). The current study is also classified under the cross-sectional research since the data have been collected around three-month period from July to September 2012.

4.2 Measurement of Research Variables

Generally, research is a routine procedure of obtaining information for the main purpose of dealing with and ultimately tackling particular problems. In an empirical study, hypothesis testing is performed through operating and measuring the study variables (Cooper & Schindler, 2003). The research variables of this study encompass Organizational Culture, Trust, intellectual capital or IC (embraces four dimensions namely, human capital, structural capital, relational capital, and social capital), performance measurement system or PMS (PMS fall into two broad dimensions, namely 'measurement diversity' and 'the balanced use of PMS'), and Organizational Performance. Organizational Culture and Trust were examined as antecedent variables for Intellectual Capital (IC) while IC components were tested as the independent variables. PMS considered as mediating variable, and finally organizational performance was treated as the dependent variable. For developing measurement items, this study has adopted well-defined and validated scale obtained from the previous studies within the existing literature. Also, all the variables (except culture) were measured on a Seven-Point Likert Scale. The next section would specifically elucidate the measurements of the research's variables.

4.2.1 Organizational Performance (OP) - Dependent Variable

As already discussed, this research perceives organizational performance as effectiveness. That is, the performance indicates the degree to which organizations

are successful in meeting their planned goals or stated objectives (Mia & Clarke, 1999). In this respect, the instrument proposed by Gupta and Govindarajan (1984) as well as Govindarajan (1988) is utilized to measure the variable of "organizational performance". This instrument assesses firm performance on multiple indicators in preference to any single indicator or factor. CFOs were asked to assess their firm's performance along the particular factors, employing a 7-point Likert-type scale with responses ranging from "significantly below average" and "significantly above average" (see Table 4.1). This measurement has been extensively applied in previous works, particularly in the management accounting context (Bisbe & Otley, 2004; Chenhall & Langfield-Smith, 1998; Govindarajan & Fisher, 1990; Hoque, 2004).

Following the substantial works in the MA literature, this current research consider aggregate firm performance to be the most appropriate measure for the purpose of hypothesis development, despite the fact that performance is assessed by either financial or non-financial measures in the questionnaire (Bisbe & Otley, 2004; Chenhall & Langfield-Smith, 1998; Govindarajan & Fisher, 1990; Hoque, 2004; Ruzita Jusoh & Parnell, 2008). Inclusion of both financial and non-financial measures in the instrument is aimed at investigating the leading indicators that typically are not publicly disclosed and also for the purpose of complementing the lagging indicators of performance. In other words, this multiple indicators approach deem to be the most appropriate scale due to embracing all facets either quantitative or qualitative, financial or non-financial performance in the evaluation (Ruzita Jusoh & Parnell, 2008; Mia & Clarke, 1999).

This study prefers self-rating and perceptual measures for financial performance, as opposed to objective measures, mainly because organizations may

adopt various accounting conventions in areas such as inventory valuation and depreciation (Powell & Dent-Micallef, 1997). Furthermore, applying the subjective performance measures would be more suitable when we face difficulties in extracting matched objective information properly in a cross-sectional study. Also, key informants (e.g. CFOs) usually refuse to provide numerical objective performance data requested in the instrument. Moreover, using perceived measures of organizational performance has been acknowledged to be a viable alternative to objective measures. For instance, Dess and Robinson (1984) asserted that perceived measures could be a plausible choice for objective indicators of performance. In a similar vein, Hansen and Wernerfelt (1989), found a strong correlation between perceived and objective measures of financial performance.

Table 4.1 Items for Measuring Organizational Performance

Variable & Question	Item	Scale	Source
Organizational Performance (Aggregated Financial and Non-Financial Measures) Please rate the performance of your firm against initial expectation on each of the following dimensions for the past 3 years	1. Return on investment 2. Profit 3. Cash flow from operations 4. Cost control 5. Development of new products 6. Sales volume 7. Market share 8. Market developments 9. Personnel developments 10. Political-public affairs	7-Point Likert: significantly below average" and "significantly above average	Govindarajan and Fisher, 1990; Chenhall and Langfield-Smith, 1998b; Bisbe and Otley, 2004; Hoque, 2004

4.2.2 Performance Measurement System (PMS) - Mediating Variable

As stated previously, two separate attributes of PMS, as two mediating variables between the relationship of IC and organizational performance, are examined individually in this study. First, the "diversity of measurement" which covers a wide range of measures either in terms of financial or non-financial indicators is addressed. Second, "the balanced use of PMS", which operationalized as the balanced use of PMS in a diagnostic and interactive style (Henri, 2006a), is investigated.

4.2.2.1 Diversity of Measurement (DM)

For measuring the 'diversity of measurement' construct, this study basically adopts the instrument used by Henri (2006b) which was originally an adapted version of Hoque and James (2000). It includes twenty performance measures items largely based on four dimensions of the balanced scorecard (BSC), namely

financial, customer, internal business process, and innovation and learning which developed initially by Kaplan and Norton (1992). In addition, the aforesaid four perspectives were supplemented by seven items came under the heading of social and environmental performance (Hoque & Adams, 2008) as the fifth perspective. Accordingly, the instrument asked about the frequency of use of total 27 performance measures which categorized under five broad dimensions. That is, the informants were asked to rate the degree of their organization's use of each measure on the five perspectives employing a 7-point Likert-type scale ranging from 1 (not at all), 4 (to a moderate extent), to 7 (to a very great extent). It is imperative to mention that, an aggregate score was computed for the 27 diverse performance measures. The breakdown of dimensions of BSC and their related measures and sources of references are included in Table 4.2.

Table 4.2 Items for Measuring Diversity of Measurement

Variable & Question	Item	Scale	Source
Diversity of Measurement Please rate the extent to which each of the following measures is used by your top management team	Financial Measures: 1. Operating income 2. Sales growth 3. Return-on-investment (ROI) 4. Return-on-equity (ROE) 5. Net cash flows 6. Costs per unit produced Customer: 7. Market share 8. Customer response time 9. On-time delivery 10. Number of customer complaints 11. Number of warranty claims 12. Survey of customer satisfaction Internal Business Processes: 13. Materials efficiency variance 14. Manufacturing lead time 15. Rate of material scrap loss 16. Labor efficiency variance	7-point Likert: 1= not at all 7=to a very great extent	Hoque and James (2000) Hoque et al. (2001); Hoque and Adams (2008) ; Henri (2006a)

Table 4.2 Items for Measuring Diversity of Measurement (Continued)

Variable & Question	Item	Scale	Source
Diversity of Measurement	Innovation and Learning 17. Number of new patents 18. Number of new product launches 19. Time-to-market for new products 20. Employee satisfaction Social and Environmental Measures 21. Employee diversity 22. Economic impacts (excluding financial measures used in financial accounts) 23. Occupational health and safety 24. Stakeholder involvement in community, social and environmental issues 25. Community relations 26. Natural resource conservation and emission levels 27. Other community, ethical, social and environmental issues	7-point Likert: 1= not at all 7=to a very great extent	Hoque and James (2000) Hoque et al. (2001); Hoque and Adams (2008) ; Henri (2006a)

4.2.2.2 Balanced PMS Use (Interactive and Diagnostic)

As mentioned earlier, Simons (1990) specifies two countervailing types of the use of control system, namely diagnostic and interactive. The former is defined as the formal feedback systems employed for monitoring predictable objective attainment whereas the latter focuses attention and foster dialogue and learning throughout the entity through providing signals sent by high level administrators. In this respect, this study took the instrument used by Henri (2006a) which was originally adopted from Vandenbosch (1999) instrument in order to measure interactive and diagnostic uses of PMS. The Vandenbosch (1999) instrument had been developed initially for the purpose of measuring the use of executive support systems (ESS). The measurement constituted by a set of dimensions which mainly includes score keeping (diagnostic) and attention- focusing (interactive). This instrument had been developed relying on theories of accounting control (Simons, 1990) prior to its adaptation to a management information setting. This is the

rationale behind the preference for the forgoing measurement tool. This instrument consists of eleven items across the two broad dimensions, namely interactive PMS use and diagnostic PMS use. The organizations' CFOs were asked to determine the extent to which their organization's top management team use performance measure for the certain purposes on a seven point Likert-type scale including one (not at all), four (to a moderate extent), and seven (to a very great extent). The details of the instrument's items are provided in Table 4.3.

Table 4.3 Items for Measuring the Balanced Use of PMS

Variable & Question	Item	Scale	Source
Balanced PMS Use Please rate the extent to which your top management team currently uses performance measures to:	Diagnostic use: 1. Track progress towards goals 2. Monitor results 3. Compare outcomes to expectations 4. Review key measures Interactive use: 5. Enable discussion in meetings of superiors, Sub-ordinates and peers. 6. Enable continual challenge and debate and underlying data, assumptions and action plans. 7. Provide a common view of the organization. 8. Tie the organization together. 9. Enable the organization to focus on common issues. 10. Enable the organization to focus on critical success factors. 11. Develop a common vocabulary in the organization.	7-point Likert: 1=not at all 7=to a great extent	Henri (2006a)

4.2.3 Intellectual Capital (IC) - Independent Variable

The applying of perceptual measures tends to predominate in the context of IC literature. As Kannan and Aulbur (2004) pointed out, perceptual measures are

commonly utilized for the purpose of investigating the organizational factors which influence manpower performance, human capital improvement and firm performance. They indicated that there is a preponderance of perceptual measures in the most often used measurement methods through scrutinizing more than 100 IC related studies. According to Sharabati et al. (2010), the both perceptual and objective measures of knowledge-based resources are broadly equivalent despite the fact that objective measures are tend to be less prone to respondent bias. They argued that the use of perceptual measures for both exogenous and endogenous constructs would tend to balance out any over-inflated response bias. Hence, employing proxy metrics and perceptual measures is more prevalent in the IC literature since measurement of intellectual properties objectively is somewhat complicated (Kannan & Aulbur, 2004).

The four components of IC, namely human capital, structural capital, relational capital, and social capital represent the independent variables of the current study. As discussed earlier, the absolute majority of the previous studies considered human capital, structural capital, and relational capital as the three main components of IC. These three components were complemented by one additional dimension labeled as social capital which has been addressed to a lesser extent in the IC literature. Overall, the respondents asked to express their opinions regarding a total of 29 questions across a set of questions in relation to their organization's stress on intellectual capital. This built the foundation on which level and shape of IC were determined. All the four independent variables quantified by using the 7-point Likert scale (1=strongly disagree, 4=neither disagree nor agree, 7= strongly agree). The instrument has previously been examined with regard to reliability within the related literature. The breakdown of each aforementioned IC components is provided below.

4.2.3.1 Human Capital (HIC)

According to Stewart (1991), employees are regarded as an organization's most important asset and the primary source of intellectual capital for any entity. In the same vein, Brooking (1996) stated that skills, abilities and expertise, problem-solving abilities and leadership are at the heart of human- centered assets of an organization while G. Roos and Roos (1997) defined it as the competence, attitude, and intellectual agility. Besides, Bontis (1998) discusses that human capital embodies individual level of knowledge which each organizational member owns. According to Edvinsson and Malone (1997), human capital is described as individuals' capabilities, skill, and experience of employees and managers. In consistent with foregoing HIC operationalization of the leading scholars in the IC literature, six items were adopted from Tayles et al. (2007) which were drawn initially from previous studies in the field (Bontis, 1998; Reed, 2000; Usoff et al., 2002) for capturing the shape and level of human capital within organizations. Accordingly, the respondents were asked to express their opinions regarding six items on a seven point Likert-type scale including one (strongly disagree), four (neither disagree nor agree), and seven (strongly agree). The details of the HIC items are provided in Table 4.4.

Table 4.4 Items for Measuring HIC

Variable & Question	Item	Scale	Source
Human Capital (HIC)	1. Our organization selects managers and staff according to their brightness and creativity. 2. Our organization gets the most out of the managers and staff. 3. Our organization requires knowledge sharing among managers and staff. 4. Our managers and staff are generally experts in their particular jobs and functions. 5. Our managers and staff are generally able to develop new ideas and knowledge. 6. Our managers and staff are generally able to focus on the quality of service provided.	7-point Likert: 1= strongly disagree 7= strongly agree	Bontis (1998); Reeds (2000); Usoff et al. (2002); Tayles et al.(2007)

4.2.3.2 Structural Capital (SIC)

Human capital per se is not able to fulfill the requirements for product development; but rather an organization is required for the purpose of exploiting its contribution. To complement an organization's human capital, structural capital or so-called organizational capital provide the required infrastructure in order to coordinate endeavors as well as convert knowledge to products. In general, structural capital measures developed commonly through technology indicators that encompass factors of efficiency, transaction times, procedural innovativeness and access to information for codification of knowledge (Bontis, 1998; Bontis et al., 2000). Besides, it is useful for codifying transferable knowledge and linking employees to expert and expertise based on a JIT model. Other indicators regard the degree which the organization document explicit knowledge, routines procedures, protects loss of vital knowledge and information (Edvinsson & Malone, 1997). For measuring structural capital in this study, nine survey items were adopted from Tayles et al. (2007) which is based originally on the leading earlier studies (Bontis,

1998; Reed, 2000; Usoff et al., 2002). This items also quantified by using the 7-point Likert scale (1=strongly disagree, 4=neither disagree nor agree, 7= strongly agree). The breakdown of items regarding structural capital is shown in Table 4.5.

Table 4.5 Items for Measuring Structural Capital

Variable & Question	Item	Scale	Source
Structural Capital (SIC)	1. Our organization's data systems make it easy to access relevant information. 2. Our organization's systems and procedures support innovation. 3. Our organization requires knowledge sharing and encourages learning. 4. Our organization has relatively high investment in innovation. 5. Our organization keeps track and makes full use of our intellectual assets such as patents and copyrights. 6. Our organization has a high rate of generation of new ideas and products compared to our competitors. 7. Our organization provides a sufficiently high annual information technology allocation (for personnel, hardware, software, etc.) to allow us to provide quality service. 8. Our organization documents knowledge in manuals, databases, etc. 9. Our organization protects vital knowledge and information to prevent loss in the event of key people leaving the organization.	7-point Likert: 1= strongly disagree 7= strongly agree	Bontis (1998); Reeds (2000); Usoff et al. (2002); Tayles et al.(2007)

4.2.3.3 Relational Capital (RIC)

Besides the two abovementioned IC dimensions i.e. human and structural capital, organizations profit from building a network of contacts with external parties such as customers, suppliers, and partners which collectively known as relational capital (RIC). That is, RIC represents the value stem from those relationships with external actors, i.e. people and entities which are outside of the boundary of the company. This is a significant differentiation from those

relationships among organizational members within the company which labeled as social capital in the context of this study and will operationalize in the next section. As mentioned above, the value of RIC or so-called “customer capital” stem from the knowledge exchange with external bodies such as customers. Nevertheless, RIC goes beyond an organization’s customer relationship. That is, it encompasses all of the mutually-beneficial alliances and coordination outside of the organization. Suppliers, partners, regulatory agencies, shareholders, capital markets, and indirect clients are all classified under the stakeholder party which adds value to a company’s relational capital (Siegel, 2004). Again, consistent with the measurement used by Tayles et al. (2007), the respondents asked to indicate their agreement regarding of 10 items on a range of questions in relation to their organization’s emphasis on relational capital (see Table 4.6). This variable also quantified by using the 7-point Likert scale (1=strongly disagree, 4=neither disagree nor agree, 7= strongly agree).

Table 4.6 Items for Measuring Relational Capital

Variable	Item	Scale	Source
Relational Capital (RIC)	1. Our organization has customers loyal to our organization / product. 2. Our organization is market-oriented / customer-focused. 3. Our organization is efficient in satisfying customer's needs and requirements 4. Our organization has most managers and employees who generally understand the organization’s targeted market segments and customer profiles. 5. Our organization gets as much feedback from our customers as we can. 6. Our organization has marketing managers and staff who continually meet with customers to find out what they want from the organization.	7-point Likert: 1= strongly disagree 7= strongly agree	Bontis (1998); Reeds (2000); Usoff et al. (2002) Tayles et al.(2007)

Table 4.6 Items for Measuring Relational Capital (Continued)

Variable	Item	Scale	Source
Relational Capital (RIC)	7. Our organization listens and responds to / manages customer complaints. 8. Our organization has good relationships with its suppliers. 9. Our organization devotes considerable time to vetting and approving suppliers. 10. Our organization maintains long-standing relationships with a number of important suppliers.	7-point Likert: 1= strongly disagree 7= strongly agree	Bontis (1998); Reeds (2000); Usoff et al. (2002) Tayles et al.(2007)

4.2.3.4 Social Capital (SOIC)

As discussed earlier, the relationship among manpower inside an organization is very important since tacit knowledge and information is shared through that network (Kogut & Zander, 1992; Nahapiet & Ghoshal, 1998; Nonaka, 1994; Tsai & Ghoshal, 1998), trust is reciprocated (Leana & Van Buren, 1999) and resources are exchanged (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). This is the reason that the three main components of IC complemented by the forth component (i.e. social capital) in the current study. Therefore, social capital refers to "the knowledge embedded within, available through and utilized by interactions among individuals and their networks of interrelationships" (Subramaniam and Youndt 2005, p. 451). In order to capture the level of social capital within an organization four items adopted from Subramaniam and Youndt (2005) which originally derived from the central premises of the social structure literature (Burt, 1992) and also from the more particular KM literature (Gupta & Govindarajan, 2000). Again, the respondents were asked to express their opinions regarding four items on a seven point Likert-type scale including one (strongly disagree), four (neither disagree nor

agree), and seven (strongly agree). The details of the social capital items are provided in Table 4.7.

Table 4.7 Items for Measuring Social Capital

Variable	Item	Scale	Source
Social Capital (SOIC)	1. Our employees are skilled at collaborating with each other to diagnose and solve problems. 2. Our employees share information and learn from one another. 3. Our employees interact and exchange ideas with people from different areas of the company. 4. Our employees apply knowledge from one area of the company to problems and opportunities that arise in another.	7-point Likert: 1= strongly disagree 7= strongly agree	Subramaniam and Youndt (2005); Burt, 1992; Gupta & Govindarajan, 2000

4.2.4 Organizational Culture - Antecedent Variable

In this study, organizational culture is captured according to the competing-values approach. In this respect, one part of the 'Institutional Performance Survey' (IPS) established at the 'National Center for Higher Education Management Systems' was employed in order to measure the organizational culture (Krakower & Niwa, 1985). This instrument was already validated by previous studies (Zammuto & Krakower, 1991). Beside, some recent accounting researchers have applied the instrument in their studies (Bhimani, 2003; Henri, 2006b). The instrument asks key informants (CFOs) to distribute 100 scores among the four ideal cultural types along each of the following four dimensions of culture: institutional character; institutional leader; institutional cohesion; and, institutional emphases. For each dimension, respondents should distribute 100 points among four sentences where organization A represents "group culture", organization B refers to "developmental culture", organization C refers to "hierarchical culture", and organization D refers to "rational culture" (see Table 4.8). Following Henri (2006b), this research aims to identify the particular position of each company according to the control/flexibility

continuum, that is to say dominant type. Cultural-type score and a value score determine the dominant- type score. In this regard, firstly, the cultural-type score is computed for each culture through averaging the ratings obtained on the four dimensions. For each organization, the sum of the four cultural types equals 100. Secondly, the value score is calculated for the control/flexibility continuum in the following manner:

Flexibility-value score = (Group-culture score + Developmental-culture score)
Control-value score = (Hierarchical-culture score + Rational-culture score)

Finally, the dominant-type score is achieved through deducting the control-values score from the flexibility values score. Concerning that the flexibility and control value scores are the extremes of a competing-values continuum, a difference score specify the particular position of each company on this continuum. That is, a positive score represents a flexibility dominant type and, on the contrary, a negative score represents a control dominant type.

Table 4.8 Items for Measuring Organizational Culture

1––Institutional characteristics (please distribute 100 points)

Description	Point
Organization A is a very personal place. It is like an extended family. People see to share a lot of themselves.	
Organization B is very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.	
Organization C is very formalized and structured place. Bureaucratic procedures generally govern what people do.	
Organization D is a very production oriented. A major concern is with getting the job done. People are not very personally involved.	
total	**100**

2—Institutional leader (please distribute 100 points)

Description	Point
The head of Organization A is generally considered to be a mentor, a sage, or a father or mother figure.	
The head of Organization B is generally considered to be an entrepreneur, an innovator, or a risk taker.	
The head of Organization C is generally considered to be a coordinator, an organizer, or an administrator.	
The head of Organization D is generally considered to be a producer, a technician, or a hard-driver.	
total	**100**

3—Institutional cohesion (please distribute 100 points)

Description	Point
The glue that holds Organization A together is loyalty and tradition. Commitment to this organization runs high.	
The glue that holds Organization B together is commitment to innovation and development. There is an emphasis on being first.	
The glue that holds Organization C together is formal rules and policies. Maintaining a smooth-running organization is important here.	
The glue that holds Organization D together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.	
total	**100**

4—Institutional emphases (please distribute 100 points)

Description	Point
Organization A emphasizes human resources. High cohesion and morale in the organization are important.	
Organization B emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.	
Organization C emphasizes permanence and stability. Efficient, smooth operations are important.	
Organization D emphasizes competitive actions and achievement. Measurable goals are important.	
total	**100**

4.2.5 Trust - Antecedent Variable

The measurement of trust was adopted from Huff and Kelley (2005) and Huff and Kelley (2003). The measurement includes eight items which capture the climate of trust inside a company as well as firm's trust for external stakeholders including, among others, customers, suppliers, and alliances (Huff & Kelley, 2003, 2005). With these measures of organizational trust, the respondents were asked to rate the extent of trust all through the company, instead of their own trust. The breakdown of items regarding organizational trust is shown in Table 4.9.

Table 4.9 Items for Measuring Organizational Trust

Variable & Question	Item	Scale	Source
Organizational Trust	1. There is a very high level of trust throughout this organization. 2. In this organization, subordinates have a great deal of trust for managers. 3. If someone in this organization makes a promise, others within the organization will almost always trust that the person will do his or her best to keep the promise. 4. Managers in this company trust their subordinates to make good decisions. 5. When this organization enters into a partnership with another organization, it usually has a great deal of trust that the other organization will work in the best interest of the partnership. 6. Once this organization establishes a business relationship with another organization, it remains very loyal to that relationship and works hard to ensure that the relationship remains strong for a long time. 7. This organization trusts that our suppliers are being honest with us. 8. This organization trusts that our customers are being honest with us.	7-point Likert: 1= strongly disagree 7= strongly agree	Huff & Kelley (2003); Huff & Kelley (2005);

4.3 Research Instrument

As Olsen (1997) noted, there are different ways in order to operationalize the concepts and claims. However, researchers are supposed to find the most relevant and most effective way to capture the maximum amount of information in terms of validity and reliability as recommended by positivists' philosophy of research design (Easterby-Smith, Thorpe, & Lowe, 1991). Applying questions as measure is at the heart of a survey procedure (Fowler, 2002). As Uma Sekaran (2006) argued, "a questionnaire is a pre-formulated written set of questions to which respondents record their answers, usually within rather closely defined alternatives". The questionnaire is regarded as a basic technique of data collection and tends to be the most popular method (Easterby-Smith et al., 1991).

4.3.1 Questionnaire Design

For this research, the structured questionnaire was posted to CFOs of Iranian public listed companies in order to collect the relevant data. This is consistent with Aaker, Kumar, and Day (2007) who asserted that the participants were more convinced in reflecting honest answer via a questionnaire. The questionnaire survey was applied for the main purpose of receiving sincere feedback and in a straightforward manner from the CFOs who were appointed to play the role as representatives on behalf of their firms. They were requested to present data about the characteristics of their organizational culture as well as the extent of organizational trust within their companies, the level and shape of their IC in their organizations, PMS usage, and the overall performance of their organizations in comparison with their competitors. Questionnaire survey is appropriate for the current study since it is a more cost effective method which can increase response rate (Uma Sekaran, 2006). That is, mail survey allows researcher to survey a large

random sample of a population at a rather low cost. Besides, mail survey exerts less pressure on an immediate response and gives the feeling of anonymity to the respondents (Gosselin, 1997).

Following P. E. Green, Tull, and Albaum (1988), the bipolar scale was used for this study whereby respondents are provided with a chance to take the other options into consideration on the other side of the continuum. They noted that through this scale the researcher would be able to realize either directions or the intensity of the respondents' absolute perceptions. Besides, it specifies more accurately the dimension instead of allowing one pole of the scale to be interpreted idiosyncratically (Goldberg, 1985). Hence, this study provided all questions regarding main variables using a seven-point Likert scale. Despite the fact that Kinnear and Taylor (1987) indicated that there is no significant difference in the results between scales, a seven point-scale is more reliable than six, five or three-point scales because the number of intervals can augment scale reliability .

The questionnaire consisted of six sections in which each section headlined by a particular heading. All the headings supplemented by explicit instructions to suit the convenience of the respondents. As suggested by Zikmund (2003), the sensitive questions are supposed to be put in the final section. Therefore, the section of demographic profile or so-called 'general information' was positioned at the end of the questionnaire in this study. A total of 29 questions regarding all the four components of intellectual capital, namely human capital, structural capital, relational capital, and social capital put under the section A. The purpose of this section was to explore and determine the level and shape of IC possessed by Iranian listed companies. Section B measures the PMS usage and fall into two broad parts; the part B1includes 27 items which explore the aspects of PMS in terms of the type

of measures in relation to a broad set of financial and non-financial measures. That is, these 27 items were segregated into five components which include financial, customer, internal business process, innovation and learning, and social and environmental measures. On the other hand, part B2 consists of 11 items and aimed at exploring the aspects of PMS in terms of the balanced use of PMS (Interactive PMS use and Diagnostic PMS use). Section C encompasses 16 items to determine the type of company in term of organizational culture. Section D includes 8 items which explore the aspects of trust within a company and ultimately determine the company's trust level. Ten financial and non-financial performance indicators are provided in section E in order to evaluate the company's recent (last three years) organizational performance relative to their key competitors in the industry. Finally, 16 questions were provided in relation to the general information about the companies and demographic profile of the participants in section F.

It is necessary to have the modified items translated into the national language of Iran given that the first language in Iran is Persian or Farsi. According to Zikmund (2003), a simple translation method might not be able to convey the real meaning of the original language because of several reasons such as issues regarding translator‘s capability as well as cultural diversities. Accordingly, a back-translation technique was used to ensure the equivalence of meaning between the original and (national) translated measures of the questionnaire survey (Brislin, 1970). So, the back-translation technique is emphasized since the translated measurement scale must be translated back into the original language to maintain the original meaning in the translated version (Behling & Law, 2000). In order to identify inconsistencies and contradictions, the original and the back-translated versions are compared afterwards (Cha, Kim, & Erlen, 2007). As Zikmund (2003,

p. 361) noted that the back-translation procedure must be carried out by someone "whose native tongue is the language that will be used in the questionnaire". In this respect, revised questionnaire was translated to Persian language through a bilingual translator firstly. Subsequently, five academic staffs in accounting and finance area that were also expert in English language were appointed to perform back-translated into the English version. Then, another accounting lecturer who was professional in English language compared both original and back-translated scales. The procedure indicated there are no significant differences between the two versions. Along with the back-translation practice, the validity and the reliability of the measurement tool were approved as well.

4.3.2 Pre Testing

A prudent researcher would perform pre-tests once questionnaire designed and prior to applying it for collecting data on which to make decisions or recommendations (Cavana et al., 2001). Pre-testing is a contributing factor in amendment and improvement the questionnaires and data gathering tools to make certain that proper questions are being asked, the accurate information would be obtained, and the data gathering procedures would be carried out well (Saunders, Saunders, Lewis, & Thornhill, 2011). Hence, pre-testing is undertaken for the main purpose of extracting feedback in relation to understanding, phrasing and the design of the questionnaire. In effect, measurement errors generally stem from the manner questions are asked and from the sequence of the questionnaire that may in turn deter participants from responding the survey questions properly (Dillman, 1991). There are various kinds of pretest which can be applied; among the most famous are face validity, content validity, and a pilot study.

In the context of the current research, the first step was involving as many senior PhD students as possible in participating in the pre-test survey to gauge their reaction on the items and gets their feedback regarding understanding, wording and general structure of the questionnaire. As Burns & Bursn (2000) stated, face validity consider the matter of whether the instrument is capable of measuring the variables of interest accurately. In particular, it was intended to determine whether the informants would find the wording of the questions not vague and comprehensible. The senior PhD students in the Faculty of Business & Accountancy together with the Faculty of Economics & Administration, University of Malaya were appointed as participants in this initial pre-test. Afterwards, an English professional editor was involved in reviewing and verifying the survey instrument in terms of phrasing and wording, use of the language and the flow of the sentences. The questionnaire was eventually amended and adjusted according to the suggestions and feedback from the editor and colleagues.

In the second phase of the pre-test, the questionnaire was sent to a group of experts (mainly include my supervisor and also the dean of the Faculty of Business and Accountancy who are both specialist in management accounting area). The questionnaire was refined consequently based on their valuable comments and feedback concerning the overall layout format, phrasing, and arrangement of the content by adding, removal or rephrasing of items as necessary. More importantly, the items were reviewed and a judgment was made on whether each item does measure the theoretical construct nominated. In addition, the content validity was already established largely due to the fact that all items used in the current study adopted from validated instrument developed and applied by highly prestigious scholars in the relate area. In addition, as mentioned above, amended questionnaire

was translated to Persian language, followed by submitting to five academic staffs to review and verify the survey instrument.

Given an acceptable content validity established, the final draft of the questionnaire was subsequently tested in a pilot study through a sample of 35 CFOs within the second board of TSE to ensure that there is no vagueness with the wording and phrasing of the measurement and to make certain that the respondents fully comprehend the questions asked. This can play a crucial role in ensuring that the questions asked were comprehensible, and pertinent to CFOs within TSE. It is important to note that, participants who were involved in the pre-test procedure were deliberately excluded from the main survey. In fact, correcting any inadequacies and inaccuracies prior to carrying out the main project seems like the sensible thing to do. Also, the approximate duration required to fill in the questionnaire was assessed. The respondents took 20 minutes approximately to fill in the whole questionnaire. This group of respondents (CFOs) provided further information about their general attitudes and reactions to the questionnaire and how they felt about the questionnaire overall. In particular, the respondents were requested to appraise the structure and format of the questionnaire in general terms, with the aim of alleviating ambiguities and communication errors. The remarks and feedback received from the CFOs were subsequently gathered and constructively reviewed prior to the adjustments were made. Eventually, the initial instrument was further amended based on useful feedback and comments received from the 35 CFOs within TSE and as well as five Iranian experts in the accounting and finance field. The adjustments brought about an overall improvement in relation to the structure and design of the overall questionnaire such as layout, spacing, font size,

instructions and content clarity as well as the appropriateness and simplicity of the language used in terms of ease of comprehension.

The Cronbach Alpha coefficient was examined in order to assess the reliability of all the constructs and their specific dimensions. In effect, alpha coefficient between 0.50 and 0.60 is regarded sufficient for the purpose of pre-test/pilot test results (Nunnally, 2010). In general, the alpha scores for all the main variables exceeded the recommended cut-off point of 0.70 (Nunnally, 1967) as are presented in Table 4.10.

Table 4.10 Results of Pilot (Pretesting) Study (n=35)

Variables	No. of items	Cronbach's alpha
Organizational Culture	16	.723
Trust	8	.898
Human Capital (HIC)	6	.839
Structural Capital (SIC)	9	.892
Relational Capital (RIC)	10	.945
Social Capital (SOIC)	4	.939
Financial Diversity of Measurement (DMF)	6	.846
Customer Diversity of Measurement (DMC)	5	.852
Internal Business Processes Diversity of Measurement (DMI)	4	.955
Learning and Innovation Diversity of Measurement (DML)	4	.810
Social and Environmental Diversity of Measurement (DMS)	7	.795
Diagnostic PMS Use (PMSUD)	4	.972
Interactive PMS Use(PMSUI)	7	.978
Organizational Performance (OP)	10	.963

Another technique of assessing the reliability is examining the item-total correlations of each variable. As Lu, Lai, and Cheng (2007) demonstrated, item-to-total correlations provide information on the extent of correlations among indicators of the same scale. Besides, they proposed that an item with a value that is less than 0.5 is considered very low score and cannot play an important role in

conceptualizing the related construct. That is, if correlation value be lower than 0.5, the corresponding item would not be correlate very well with the scale overall and, consequently, it may be dropped. In this research, Item-total Correlations scores for all the items exceeded the recommended cut-off score of 0.5 as presented in appendix **(B)**.

4.4 Sampling Frame and Population

The economy of Iran is diversified economy with over 40 industries directly involved in the Tehran Stock Exchange. As recommended by Bontis (1998), a multi-industry sample would allow an investigation of inter-industry effects and potentially broaden the study's generalization. As Subramaniam and Youndt (2005) also asserted, the inclusion of a broad group of organizations and industries is intended to maximize variation of the variables and also to increase the generalizability of the findings. Besides, worldwide studies of multi-industry markets in varying phases of development enable economists to gain valuable insights into momentous institutional features that may yield positive and desired result (Foster & Kharazi, 2008). Accordingly, the population of this research encompasses all companies listed in the Tehran Stock Exchange (TSE) in the year 2012. According to the "Tehran Stock Exchange Monthly Report" (as of May 2012), 339 companies with a combined market capitalization of US$104.21 billion were listed on TSE. Because of the limitation of the number of population and also taking full advantage of a multi-industry sample, as just outlined above, no sampling was exploited in order to provide a more valid, reliable and comprehensive study and accordingly the whole population was selected as research sample. TSE companies were selected since the vast majority of them are medium to large-sized firms which plausibly possess greater resource available for

investment in knowledge-based resources and also actively engaged in more innovative/strategic management accounting control systems. Besides, all the companies' information and data are accessible widely in TSE. The mailing list provided by TSE directory has complete information on the public listed companies across Iran such as managing directors' names, addresses, contact numbers, types of product/service manufactured/provided, number of employees, years of establishment and so forth.

TSE is considered as the largest stock exchange of Iran which is located in Tehran, the capital of the country, and initially established in 1967. Nowadays TSE has become a thrilling and flourishing market in which either individual or institutional investor deal in securities of more than 330 organizations with a market capitalization of US$104.21 billion. In recent years, TSE is recognized as one of the world's best performing stock exchanges. TSE, which becomes a full member of the World Federation of Exchanges and a founding member of the Federation of Euro-Asian Stock Exchanges as well, is an emerging and cutting-edge marketplace. Compared to other regional markets, one of the special privileges of TSE lies in the fact that more than 40 industries directly involved in it.

4.4.1 Unit of Analysis and Key Informants

The unit of analysis represents the level of aggregation of the data collected during the subsequent data analysis phase (Cavana et al., 2001). It can be consisted of cultures, organizations, departments, work groups, dyads, and individuals (Zikmund, 2003). According to Cavana et al. (2001), once the research question is formulated, it is essential that the unit of analysis would be determined due to the fact that the data gathering techniques, sample size and even the variables of

interest may occasionally be determined or guided by virtue of the level at which data are aggregated for analysis. This study selected all the public listed companies within the TSE in Iran as the unit of analysis, inasmuch as these organizations are perceived as the most prominent and dominant group among the organizations in Iran.

The questionnaires were administered to the Chief Financial Officers via postal service. These targeted respondents were appointed because of their high level of proficiency in the subject-matter as well as their hands-on experience. CFOs are considered in this research since they are knowledgeable about and directly involved in the administrative processes and procedures of company. Moreover, they are commonly the persons that appraise the extent to which strategic objectives have been achieved through analyzing the performance measures.

4.4.2 Sample Size

As Loehlin (2012) pointed out, the sample size is of vital importance since it can affect the level of difference in covariance matrices. In this respect, having a sufficient sample as well as high quality data collection endeavors would bring about more reliable, valid, and generalizable results (Bartlett & Kotrlik). As this study applied PLS, the sample size of 128 respondents is well adequate in that regard (full details of the data collection process and response rate will be discussed comprehensively in the beginning of the next chapter, i.e. Chapter Five). One of the major advantages of adopting PLS as a structural equation modeling (SEM) technique lie in the fact that it most likely work with smaller samples. Generally, the most complex regression will involve: I) the indicators on the most complex

formative construct, or II) the largest number of antecedent constructs leading to an endogenous construct. Sample size requirements become at least ten times the number of predictors from I) or II), whichever is greater (Barclay, Higgins, & Thompson, 1995). In the current study, the second requirement is the case and it should be fulfilled since there are not any formative indicators. The largest number of antecedent variables pointing to an endogenous variable is two (2 * 10 = 20). In this case, twenty is much lower than the overall sample size of 128.

4.5. Data Analysis Techniques Used

Two statistical software programs were employed to analyze the data collected in this study. SPSS18.0 was used for descriptive statistics, reliability testing, exploratory factor analysis and SMARTPLS V2.0 M3 (Ringle, Wende, & Will, 2005), which using partial least squares (PLS), was employed for confirmatory factor analysis and hypotheses testing presented in the next Chapter.

Partial Least Square (PLS) was employed in order to assess both measurement and structural models. It is necessary to explain the general SEM concept and evolution because PLS path modeling is classified as one of the structural equation modeling (SEM) techniques. SEM has been widely applied in various research fields, specifically in social science context. In effect, SEM has been utilized for modeling the complex association of multiple exogenous (independent) and endogenous (dependent) constructs. It is perceived as a second generation of multivariate analysis, created for the main purpose of overcoming the shortcomings of those first generation ones including standard regression-based analyses, such as multiple regression, discriminant analysis, logistic regression, and analysis of variance. Shortcomings of the first generation multivariate analysis technique

encompass (a) the postulation of a simple model, (b) the assumption that all variables can be considered observable and (c) the assumption that all variables are measured without error. The advantage that SEM has over first generation technique is the greater flexibility that researchers are allowed to "(a) model relationships among multiple predictors and criteria variables, (b) construct unobservable latent variables, (c) model errors in measurements for observed variables and (d) statistically test a priori substantive/theoretical and measurement assumptions against empirical data". In other words, SEM is able to evaluate either the reliability or validity of the measures of theoretical variables as well as to test the associations among the constructs of interest simultaneously.

SEM techniques fall into two broad categories, namely covariance-based analysis and variance based analysis. The former perspective normally utilizes maximum likelihood (ML) while the latter employs least square (LS) function. The popular statistical software packages pertinent to covariance-based analysis are LISREL, AMOS and EQs. On the other hand, the most popular statistical method in relation to the variance based approach or so-called component-based analysis is partial least squares (PLS) path modeling which is the case in the current study.

PLS path modeling is occasionally labeled as "soft modeling" while covariance-based SEM model (ML) is termed "hard modeling." As Wold (1982, p. 25) stated, this can be attributable to the fact that ML "aims at optimality in statistical inference, and is designed for testing hypotheses that are sharp and pure; accordingly, ML is insensitive to the inaccuracies of real-world models and impurities of real data. PLS is distribution-free (nonparametric statistics), and aims only at (predictive) consistency, and is therefore insensitive to impurities in the

model and the data." PLS method is quite robust against manifest variables' skew distributions, multicollinearity within the blocks of manifest variables and between latent variables, and misspecification of the structural model.

Joreskog and Wold (1982) pointed out that "in the non-experimental analysis the consistency of PLS analysis is a viable and often preferable alternative to the optimality aspirations of co-variance based analysis approaches and suggested that ML is best used for theory testing and development while PLS is oriented more towards predictive application." Barclay et al. (1995) argues that "PLS is generally recommended for predictive research model where emphasis may be more on theory development, LISREL (SEM-ML approach) is more suited for testing, confirmatory sense, how well a theoretical model fits observed data, generally requiring much stronger theory than PLS. The two methodologies should be viewed as complementary or in some cases PLS can be viewed as a precursor to the use of LISREL." Table 4.11 compares the PLS path modeling and the covariance-based SEM.

Table 4.11 Comparison of Partial Least Squares (PLS) path modeling and covariance-based (ML) Structural Equation Modeling (SEM)

Criterion	**Partial Least Squares**	**Covariance-based SEM**
Objective	Prediction oriented	Parameter oriented
Approach	Variance based	Covariance based
Theory base required	Does not necessarily require sound theory base. Supports both explanatory and confirmatory research.	Requires sound theory base. Supports confirmatory research.
Assumptions	Relatively robust to deviations from a multivariate distribution. Predictor specification (nonparametric)	Typically need multivariate normal distribution and independent observations (parametric)
Parameter estimate	Consistent as indicators and sample size increase (consistency at large sample sizes)	Consistent
Latent variable scores	Explicitly estimated	Indeterminate
Epistemic relationship between a latent variable and its measures	Can be modeled in either formative or reflective mode	Typically only with reflective indicators
Implications	Optimal for predictive accuracy	Optimal for parameter accuracy
Model complexity	Large complexity (e.g. 100 constructs and 1,000 indicators)	Small to moderate complexity (e.g. less than 100 indicators)
Sample size	Power analysis based on the portion of the model with the largest number of predictors-minimal recommendations range from 30 to 100 cases or at least 10 times the number of items in the most complex construct model.	Ideally based on power analysis of specific model-minimal recommendations range from 200 to 800.

The analysis of PLS-based models was conducted using SmartPLS V 2.0 M3 software in this research. Model evaluation statistics for the PLS- based model is different from those of the covariance based SEM model. Instead of using the goodness of fit statistics to evaluate a model like the covariance based SEM, the PLS path modeling employs R-square for dependent latent variables, and effected the size of predictors on predicted variables (f2) to evaluate the predictiveness of the model. The estimation of beta coefficients in PLS's structural model is interpreted in the same manner as the beta coefficients in multiple regression

analysis. The stability of the estimates is examined using the bootstrapping procedure. The bootstrapping (a resampling method) produces standard errors of the estimates for t-statistics test. To evaluate the measurement model, composite reliability and Cronbach's alpha are used to evaluate reliability, average variant extract (AVE) measures are used to evaluate convergent and discriminant validity of the measurement model.

4.6 Summary

The chapter was begun with a discussion on the research design of the study which included explanations regarding research paradigm, research approach, and research methodology. Subsequently, operational definitions as well as measurement scales were provided for measuring the research variables. Furthermore, the survey instrument was designed and its validity and reliability was estimated by expert judgment and pilot study. Target population and sampling method utilized for this study were elaborated afterwards. Ultimately, the relevant data analysis techniques which are apposite to the current study were introduced.

The next chapter explains the procedure of data analysis. Firstly, the processes of questionnaire administration, data collection, as well as the response rate and response bias analysis are presented followed by the discussion on the preparation of the collected data for the purpose of data analysis. Besides, the profile of the respondents either in terms of individual or organizational aspect are presented. After that, the exploratory factor analysis for some certain variable of the study is presented followed by the related confirmatory factor analysis. Next, PLS-SEM technique is utilized for data analysis, including two separate stages: first, the measurement model, which itself covers composite reliability, discriminant validity, and convergent validity, is assessed. Second, the report of performing structural model, in which the hypotheses are tested, is presented.

CHAPTER FIVE
DATA ANALYSIS AND RESULTS

5.0 Overview

This chapter discusses the detailed data analysis and the results of the survey based on the analysis techniques introduced in the previous chapter. As explained in Chapter Four in which the research design was presented, an eleven-page questionnaire was applied to capture the theoretical constructs of the research, namely Organizational Culture, Organizational Trust, Intellectual Capital (IC), Diversity of Measurement (DM), the Balanced Use of PMS (PMSU) and Organizational Performance (OP). The questionnaire was distributed to the targeted companies after establishing the content and face validity of the questionnaire. The following sections present the data collection process as well as detailed procedure of analysis of the data collected and the results. As mentioned in the previous chapter, two statistical software programs were used in order to analyze the data gathered in this research. SPSS18.0 was employed for the purpose of descriptive statistics, reliability testing, and exploratory factor analysis while SMARTPLS V2.0 M3 (Ringle et al., 2005), which using partial least squares (PLS), was utilized for confirmatory factor analysis as well as hypotheses testing presented in this chapter. As can be seen, the Figure 5.1 illustrates a detailed overview of the current chapter.

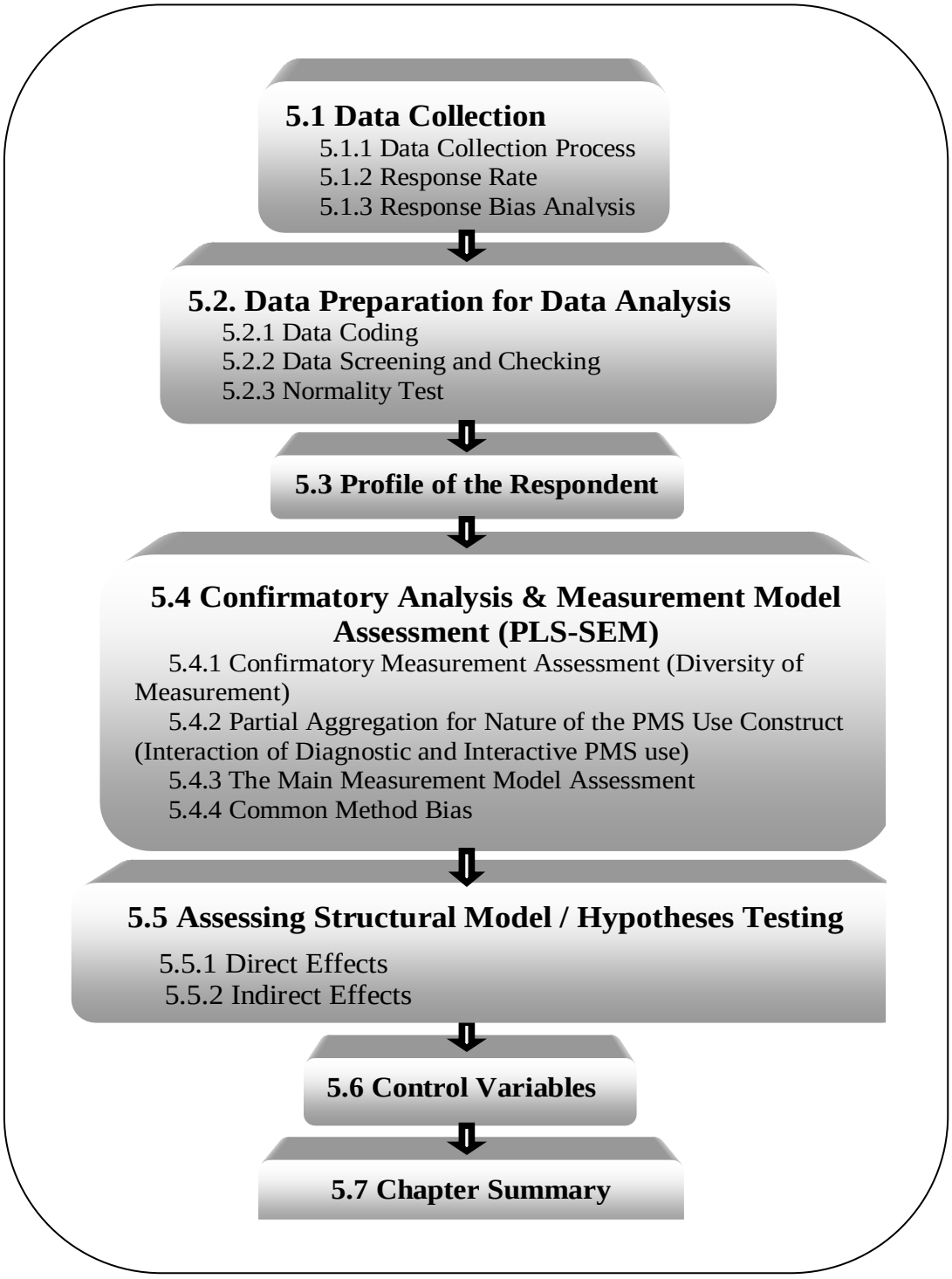


Figure 5.1
Overview of Chapter Five (Data Analysis and Results)

5.1 Data Collection

5.1.1 Data Collection Process

The data collection procedure for the current study was carried out via the structured questionnaire. The questionnaire supplemented by a cover letter posted to the Chief Financial Officers of the sampled 339 companies within Tehran Stock Exchange (TSE) in Iran. The questionnaire was produced and bound in the shape of a booklet which totally contains eleven double-sided pages in which the cover letter appears on the front page. The cover letter had been written on the University of Malaya letterhead and embodied a clear explanation regarding the nature of the study, research purposes, and the implication of the study. Besides, it included an appeal to the respondents to collaborate closely in participating in the survey. The approximate time required to answer the questionnaire was mentioned as well. It was also noted that the information provided by the respondent will be kept strictly confidential and guaranteed that all the information given and study related reports will not be accessible to anyone else except the researcher and the research supervisor. It was also emphasized that information provided would only be reported in aggregate manner and no particular company's findings will be presented. The cover letter ended with introducing the researcher and the research supervisor along with providing contact information in the case of any inquiry about the questionnaire.

First of all and prior to mailing the survey, the companies were contacted to inquire whether they would like to participate in the research. A self-addressed reply-paid envelope with sufficient postage was also enclosed with the questionnaires to suit the convenience of respondents. Subsequently, questionnaires were mailed to the 339 organizations getting started in the mid-June 2012. The

respondents were encouraged and requested to answer and return the questionnaire within 2-3 weeks after its delivery. This period of time was consistent with delays in the mailing and the delivery of the questionnaire countrywide. After a period of one month, an ensuing telephone call was made and a follow-up reminder letter sent to every single subject of the sample who had not replied. Non-respondents subjects were stimulated by one additional follow up reminder letter accompanying questionnaire starting at mid-July for the purpose of augmenting the response rate. An appeal was made to the respondents for answering and returning the questionnaire within 2-3 weeks in consistent with the first stage of data collection.

5.1.2 Response Rate

The overall data collection procedure was a three-month period approximately commencing in the middle of June 2012 and closing around the middle of September 2012. Hence, the first stage of the data collection launched in the mid-June with distributing all the 339 questionnaires among sample's every single subject. Around sixteen percent (54 respondents) out of 339 questionnaires replied by the middle of July 2012. In the wake of relatively low response rate, the second stage of data collection was undertaken afterwards. In this regard, 285 questionnaires along with reminder letter were posted again to non-response organizations in the mid-July 2012. Another 82 responses were consequently captured, reaching a total of 136 questionnaires eventually. Nevertheless, eight questionnaires were discarded totally, inasmuch as they were virtually unusable because of the incompletely questionnaire answering as well as repeated marking of the scale's extreme points. Accordingly, a total of 128 respondents were considered usable with a respond rate of 37.7 % which is perceived rather high in comparison with the company survey in which the typical response rate is 20% (Dooley, 2000).

Dooley (1995) and Nederhof (1985) also pointed out that mailed survey response rates average around the 20 to 30% mark. The data collection process was eventually completed with 128 questionnaires coded and used for data analysis by the end of September 2012. Table 5.1 shows the details and the whole procedure of the data collection.

Table 5.1 Response Rate

Descriptions	Number	Percent (%)
Total Targeted sample	339	100
First phase : Total questionnaires distributed at 13 June 2012 Total questionnaires received by 10 July 2012 Less: Unusable Total usable responses	 339 54 3 51	 100 15.92 15.04
Second phase: (**non-response organizations)** Total questionnaires distributed at 16 July 2012 Total questionnaires received by 10 Sep 2010 Less: Unusable Total usable responses	 285 82 5 77	 100 28.7 27.01
Total	**128**	**37.7**

5.1.3 Response Bias Analysis

There was an absolute necessity of analyzing the response and non- response bias due to the fact that many questionnaires remained unanswered and only 128 out of 339 questionnaires were returned (37.7% response rate) within the stipulated time. According to Armstrong and Overton (1997), an examination of existence differences between early and late responses can detects possible response bias in which late responses are treated as a proxy for non-respondents. Since the procedure of data collection of this study was performed in two early and late

phases, an independent sample t-test was utilized to assure the representativeness of the sample. Table 5.2 provides the results of the t-test. The group of 51 respondents which participated in the first phase of data collection were tagged as group one (early response). On the other hand, group two was those respondents whom participated in the second phase of data collection and was labeled ‘late response’. According to “the continuum of resistance model” late respondents are deemed to be a proxy for non-respondents in assessing non-response bias (Lahaut et al., 2003). Therefore, group two including 77 respondents (late responses) was treated as proxies of those who did not participate in the first phase of data collection. This study treated all the main variables as the test variables in performing the t-test (see appendix C-1).

Table 5.2 The Result of Differences (T-Test) of Early and Late Response on the Research Variables

Variables	Mean		t-value	Sig.
	Early response N=51	Late Response N=77		
Organizational Culture	-25.0592	-21.6234	-.452	.653
Trust	4.633600	4.736147	-.418	.677
Human Capital	4.7737	4.8896	-.588	.558
Structural Capital	4.6863	4.8831	-.949	.345
Relational Capital	5.1176	5.3506	-1.145	.255
Social Capital	4.5686	4.6234	-.226	.822
Financial- Diversity of Measurement	4.2384	4.4135	-.638	.525
Customer- Diversity of Measurement	4.5712	4.6409	-.323	.747
Internal Business Processes- Diversity of Measurement	4.4991	4.7095	-.858	.393
Learning and Innovation- Diversity of Measurement	4.3824	4.5710	-.678	.499
Social and Environmental- Diversity of Measurement	4.4098	4.6597	-1.123	.264
Diagnostic PMS Use	4.9314	5.3301	-1.658	.100
Interactive PMS Use	4.4784	4.8325	-1.373	.173
Organizational Performance	4.3035	4.2835	.073	.942
Note: Level of significance using t-tests; the mean difference is significant at $p < .05$				

The result indicated that the mean of all the variables for the two groups of respondents were relatively closed, in which this case there was not any significant difference between early and late respondents in terms of the main variables.

5.2. Data Preparation for Data Analysis

The data must be prepared for the purpose of data analysis once it is obtained through the questionnaires. In this regard, a categorization scheme was set up and the data was coded afterwards. Subsequently, the blank responses were handled followed by keying the data into the software program. The following sub-sections will elaborate each of these phases of data preparation.

5.2.1 Data Coding

Following Sekaran and Bougie (2010), a coding sheet was employed in order to transcribe the data from the questionnaire. As stated earlier, the questionnaire included items regarding the profile of the respondents as well as questions which measured the research's theoretical constructs. The responses to all items were coded as presented in Table 5.3 below.

Table 5.3 Codes Used for Transcription of Data from the Questionnaire

Item / Variable	Categories	Code	Item / Variable	Categories	Code
Intellectual Capital	Strongly disagree	1	sales / turnover (Based on Billion Riyals)	Less than 500	1
	Quite disagree	2		501 – 1000	2
	Slightly disagree	3		1001 – 1500	3
				1501 – 2000	4
				More than 2000	5
	Neither disagree nor agree	4	Gender	Male	1
	Slightly agree	5			
	Quite agree	6		Female	2
	Strongly agree	7			
Performance Measurement System	Not at all	1			
	To a Very Small Extent	2			
	To a Small Extent	3	Age	Below 30 years old	1
	To a moderate extent	4			
	To a fairly great extent	5		31-40 years old	2
	To a great extent	6			
	To a very great extent	7		41-50 years old	3
Organizational Performance	Significantly below average	1			
	Quite below average	2		Over 50 years old	4
	Slightly below average	3	Level of education	Diploma	1
	Average	4		Degree	2
	Slightly above average	5		Masters	3
	Quite above average	6		PhD	4
	Significantly above average	7			
Type of the industry	Manufacturing	1	Employment with this company	Less than 1	1
	Non-manufacturing	2		1 – 2	2
No. of employees	Less than 100	1		3 – 5	3
	100 – 200	2			
	201 – 400	3		6 – 10	4
	401 – 600	4			
	More than 600	5		over 10	5

5.2.2 Data Screening and Checking

A total of 100 items was manually keyed into the Statistical Package for the Social Sciences (SPSS). The data entry process was double checked to minimize error. Then, a frequency distribution for each variable in the study, as well as the missing value analysis was run to ensure that the data was 'clean'. As mentioned

earlier, eight questionnaires were discarded because the respondents did not answer at least a minimum of 25 percent of the questions. In terms of some of the unanswered questions, which were less than 5% unanswered, the average score was assigned to manage blank responses (Sekaran & Bougie, 2010). This method was plausibly performed due largely to limitations such as difficulty to contact respondents and most of them were busy.

5.2.3 Normality Test

As explained previously, PLS method is quite robust against manifest variables' skew distributions, multicollinearity within the blocks of manifest variables and between latent variables, and misspecification of the structural model. That is, PLS is capable of modeling linear relationships without the constraints of the other structural equation modeling and under conditions of non-normality and small to medium sample sizes (Chin, Marcolin, & Newsted, 2003). Nevertheless, the normality test was performed additionally to ensure whether a data set is well-modeled by a normal distribution or not. In this regard, this study test for the symmetric nature and peakedness / flatness for the data set using the shape descriptors, skewness and kurtosis, respectively. A variety of opinions can be found concerning the acceptable level of skewness (the symmetry of a distribution) and kurtosis (the clustering of scores toward the centre of a distribution) for a particular variable (George & Mallery, 2003) . The skewness value for measurement item ranges from -0.081 to -0.876, are well within the recommended range of -1 to +1 (Hair, Black, Babin, Anderson, & Tatham, 2006). Kurtosis value for measurement item ranges from -0.273 to +1.672, are well within the recommended range of -2 to +2 (Jarque & Bera, 1980). As such, the test indicates that this result has been revealed having data of normal distribution. Appendix **(C-2)** shows the skewness

test and kurtosis test of all constructs' items i.e. culture, trust, intellectual capital (IC), diversity of measurement (DM), the balanced use of PMS (PMSU) and organizational performance (OP).

5.3 Profile of the Respondents

Frequency distributions were obtained for all the personal data or classification variables. As presented in detail in Table 5.4, respondents' profiles are based on the organizations' characteristics which consist of the type of industry, number of employees, and annual sales turnover. Also, Table (5.5) covers demographic profile based on the individual that includes gender, age, education level, and employment with the company (years of working experience).

Table 5.4 Demographics Profiles (Organization)

Profile	Categories	Frequency	Percent	Cumulative Percent
Type of the industry	Manufacturing	103	80.5	80.5
	Non-manufacturing	25	19.5	100.0
No of employees	Less than 100	27	21.1	21.1
	100 – 200	26	20.3	41.4
	201 – 400	17	13.3	54.7
	401 – 600	27	21.1	75.8
	More than 600	31	24.2	100.0
sales / turnover (Based on Billion Riyals)	Less than 500	60	46.9	47.6
	501 – 1000	19	14.8	62.7
	1001 – 1500	6	4.7	67.5
	1501 – 2000	6	4.7	72.2
	More than 2000	35	27.3	100.0

Most respondents are from the manufacturing industry, which is the biggest industry player in Iranian public listed companies, with the dominant proportion of 80.5%. Regarding the number of employees, almost 21.1 percent of the organizations employed less than 100 employees, while the rest (78.9%) possesses

more than 100 employees. In this regard, the employee group of ‘more than 600’ was most in terms of proportion with 24.2 percent of the total respondents while the employee group of ‘201-400’ was the least with 13.3%. Moreover, 61.7% of the companies have less than 1000 Billion Riyals annual turnover while the rest (38.3%) gain more than 1000 Billion Riyals. In this respect, the annual turnover group of ‘Less than 500’ was most in terms of proportion with 46.9 percent of the total respondents whereas the sale group of ‘1001 – 1500’ and also ‘1501 – 2000’ were the least with 4.7%.

As demonstrated in Table 5.5, the gender of respondents consisted of much more male respondents (82.8%) as compared to female respondents (16.4%). This percentage of male and females is representative of the current number of managers in Iranian companies where most of whom are males. For age-wise, around two-thirds (62%) of the respondents were between 31-50 years old. The age group of 41-50 years old was most in terms of proportion with 35.9 percent of the total respondents while the age group below 30 years old was the least with 14.8%. The statistics show that most (57.1%) of the respondents are more than 41 years old.

With respect to education level, most (57.8%) of the respondents held undergraduate degrees, while the rest (39.9%) of respondents held postgraduate degrees. This indicates that the respondents were highly educated which is reflective of the positions held by them. An examination of the respondents’ years of employment with their present company indicated that one-third (37.6%) of respondents having less than 5 years of experience in their companies. A larger proportion (33.6%) of respondents was under the category of 6-10 years of experience. Also, more than one-quarter (27.3%) of the respondents had more than

10 years of experience. In summary, about two-third (60.9%) of the respondents had more than 6 years of experiences in their companies. These figures demonstrate that the respondents are familiar with the company's processes and business environment. Hence, they have the relevant knowledge to answer the questionnaire which results later in a more reliable analysis.

Table 5.5 Demographics Profiles (Individual)

Profile	Categories	Frequency	Percent	Cumulative Percent
Gender	Male	106	82.8	83.5
	Female	21	16.4	100.0
Age	Below 30 years old	19	14.8	15.1
	31-40 years old	33	25.8	41.3
	41-50 years old	46	35.9	77.8
	Over 50 years old	28	21.9	100.0
Level of education	Bachelor	74	57.8	59.2
	Masters	39	30.5	90.4
	PhD	12	9.4	100.0
Employment with this company (years of working experience)	Less than 1year	2	1.6	1.6
	1 – 2	17	13.3	15.1
	3 – 5	29	22.7	38.1
	6 – 10	43	33.6	72.2
	Over 10	35	27.3	100.0

5.4 Exploratory Measurement Assessment

Exploratory Factor Analysis (henceforth referred to as EFA) is a technique for data exploration and to determine the structure of factors to be analyzed. It is used to establish dimensionality and convergent validity of the relationship between items and constructs. To justify the application of factor analysis in this study, the measure of sampling adequacy, a statistical test to quantify the degree of inter-correlations among the variables (Hair et al., 1998) was used. The measure of sampling adequacy uses the Bartlett's Test of Sphericity (Bartlett's Test) and Kaiser-Mayer-Olkin (KMO). The Bartlett's Test should be significant ($p<0.05$) for the factor analysis to be considered

appropriate and the measure of sampling adequacy produces the KMO index that ranges from 0 to 1, and indicates that KMO more than 0.60 are considered appropriate for factor analysis (Pallant, 2001).

In this study, factor analysis was merely performed for the 'Diversity of Measurement' variable (largely borrowed from Kaplan and Norton's BSC measures) since this construct contains new items classified under the heading of "Social and Environmental" perspective in addition to other four main perspectives of Kaplan and Norton's BSC measures. The four constructs of IC, namely Human Capital, Structural Capital, Relational Capital, and Social Capital were not subjected to PCA, inasmuch as they were already treated as four individual variables. Likewise, factor analysis was not conducted for "the balanced use of PMS" variable because each item was particularly designated for each PMS Use type. Besides, factor analysis was not used for "Organizational Performance" variable due to the fact that there is an obvious distinction which performance is either nonfinancial or financial measures.

Consequently, factor analysis under the extraction method of principal component analysis with the rotation method of varimax with Kaiser Normalization was used for the 26 items of the diversity of performance measures to designate their groups based on the Balanced Scorecard's four perspective in addition to a new perspective, i.e. social and environmental measurement which is regarded new in this study and in itself includes seven measures. Varimax rotation was favored since it minimized the correlation across factors and maximized within the factors. This helped to yield 'clear' factors (Nunnally, 1978). In fact this method is robust and able to simplify the factor loadings and supports the interpretation. Factor loading indicates the strength of the relationship between the item and the latent construct and thus, is used to ascertain the

convergent and discriminant validity of the scales (Hair et al., 2006). Nunnally (1978) posits that items with loadings higher than 0.50 on one factor are retained for further analysis.

The results specify the Barlett Test of Sphericity (Barlett, 1954) met statistical significance (Chi-Square = 3160.988, $p < .01$) and the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy was .880, greater than the recommended value of .60 (Kaiser, 1974). Accordingly, these results indicate that the factorability of the data is regarded appropriate. After running the factor analysis, five components factors were extracted with eigen values greater than 1, explaining a total of 76.7% of the variance, with component 1 contributing 45.63%, component 2 contributing 14.2%, component 3 contributing 8.1%, component 4 contributing 4.92%, and component 5 contributing 3.93%. Table 5.6 shows the results factor analysis of the diversity of measurement (DM) construct. Also, the original principal component analyses with varimax rotation are presented in appendix (C-4).

Table 5.6
Exploratory Factor Analysis of the Diversity of Measurement

Factors/Items	Factor loading
Diversity of Measurement - KMO = 0.880 Barlett's: Sig. = 0.000	
Factor 1: Financial Measures	
• Operating income	0.793
• Sales growth	0.777
• Return-on-investment (ROI)	0.712
• Return-on-equity (ROE)	0.849
• Net cash flows	0.755
• Costs per unit produced	0.639
Factor 2: Customer measures	
• Market share	0.611
• Customer response time	0.783
• On-time delivery	0.637
• Number of customer complaints	0.731
• Survey of customer satisfaction	0.655
Factor 3: Internal Business Processes Measures	
• Materials efficiency variance	0.817
• Manufacturing lead time	0.807
• Rate of material scrap loss	0.746
• Labour efficiency variance	0.805
Factor 4: Innovation and Learning Measures	
• Number of new patents	0.837
• Number of new product launches	0.871
• Time-to-market for new products	0.814
• Employee satisfaction	0.709
Factor 5: Social and Environmental Measures	
• Employee diversity	0.775
• Economic impacts (excluding financial measures used in financial accounts)	0.822
• Occupational health and safety	0.816
• Stakeholder involvement in community, social and environmental issues	0.854
• Community relations	0.819
• Natural resource conservation and emission levels	0.799
• Other community, ethical, social and environmental issues	0.729

5.5 Confirmatory Analysis & Measurement Model Assessment (PLS-SEM)

Partial Least Square was employed to assess both the measurement and structural models. PLS has been widely adopted by IC scholars (Bontis, 1998;

Bontis et al., 2000; Cabrita & Bontis, 2008; Cleary, Kennedy, O'Donnell, & O'Regan, 2007) due largely to its capability to model linear associations regardless of the limitations of other SEM techniques, such as normality and large sample size that coordinates with estimated indicators (Chin et al., 1996; Chin et al., 2003). PLS simultaneously models the structural paths and measurement paths (Chin et al., 1996). The algorithm in PLS allows each indicator to vary in how much it contributes to the composite score of the latent variable. Chin et al. (2003) has especially demonstrated the interaction effects by PLS latent variable modeling.

The sample size of 128 exceeded the recommended minimum of 20, which represented 10 times the number of exogenous constructs influencing endogenous constructs (Barclay et al., 1995; Chin et al., 2003; Ko, Kirsch, & King, 2005). The exogenous constructs include organizational culture and trust. Accordingly, the PLS is a plausible option with regard to a sample size of 128. PLS examines constructs which are assessed by psychometric scales. Besides, it is capable of determining the strengths and directions of the predetermined associations.

Similar to other structural equation modeling techniques, a two-step process is typically utilized in PLS (Chin et al., 2003; Chwelos, Benbasat, & Dexter, 2001; Karimi, Somers, & Gupta, 2004; Ko et al., 2005; Teo, Wei, & Benbasat, 2003; Wixom & Watson, 2001). The measurement model is assessed at the outset, along the same lines as factor analysis and tests of unidimensionality. The next phase is assessing the structural model with the aim of providing path coefficients which demonstrate the associations of each variable. The estimation of the measurement model provides factor loadings and reliability measures from items to latent

constructs whereas the assessment of the structural model illustrates the path coefficients for significant effects on the relationships between constructs. Different from covariance-based SEM, the significance of path coefficients in PLS-SEM can only be estimated through a resampling method with Bootstrapping or Jackknifing options. In this research, the data analysis used the Bootstrapping technique.

PLS-SEM is capable of handling either formative or reflective measurement models. Reflective indicators are considered as functions of the latent construct, and changes in the latent construct are reflected in changes in the indicator (manifest) variables (Hair, Ringle, & Sarstedt, 2011). Reflective indicators are represented as single-headed arrows pointing from the latent construct outward to the indicator variables; the related coefficients for these relationships are labeled as outer loadings in PLS-SEM. On the contrary, formative indicators are supposed to cause a latent construct, and changes in the indicators determine changes in the value of the latent construct (Diamantopoulos & Winklhofer, 2001; Hair et al., 2011). Formative indicators are represented by single-headed arrows pointing toward the latent construct inward from the indicator variables; the related coefficients for these formative relationships are labeled as outer weights in PLS-SEM. Based on the prior empirical studies, all nine multi-item exogenous and endogenous constructs were operationalized as reflective constructs in this research.

5.5.1 Confirmatory Measurement Assessment (Diversity of Measurement Construct)

Among the nine variables of this research, only Diversity of Measurement (DM) is a second-order construct. This second order construct was assessed in PLS

model whether its five dimensions (first-order constructs i.e. financial, customer, internal business process, learning and innovation, and finally social & environmental perspective) are salient dimensions of DM (second-order construct). Figure 5.2 illustrates the loadings between the first-order and second-order construct. All loadings were inspected and significance was assessed via 5000 bootstrapped iterations. All loadings were significant at $p < 0.001$ level and above 0.7 as recommended by Chin (2003).

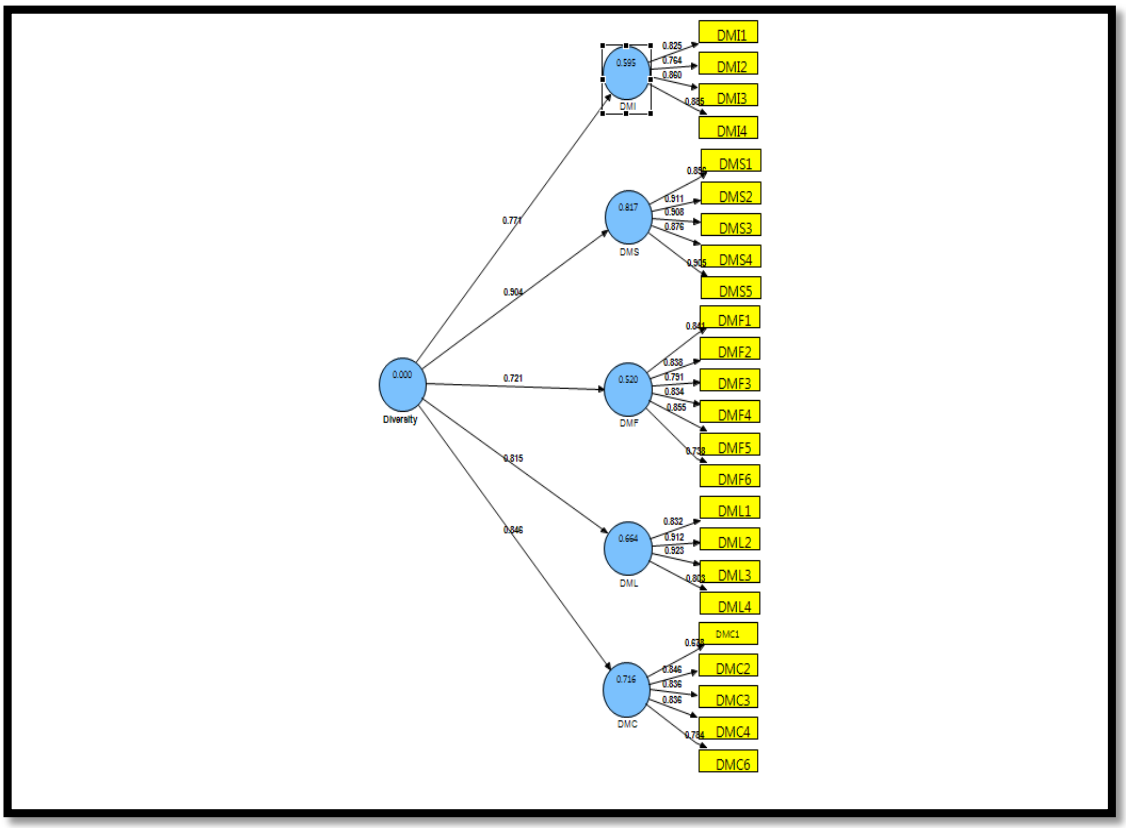


Figure 5.2
PLS Results for Diversity of Measurement 2nd Order Model

In order to deal with this construct in the final measurement model (the process of aggregation the diversity of measurement construct), the appropriate approach i.e., Two-Stage Approach (Henseler, Wilson, Gotz, & Hautvast, 2007) was applied to perform analysis. That is, given that the number of manifest

variables of DM was too high and all the other main variables of the study (which are included in the final measurement model) were first order, Two-Stage Approach, which is commonly used in the PLS analysis for higher-order constructs (Anderson & Gerbing, 1988), was employed as the appropriate approach to conduct the measurement model assessment.

In effect, the Two-Stage Approach is applied when latent variable scores are originally assessed without the second-order construct present, but with all of the first-order constructs only within the model (Agarwal & Karahanna, 2000; Henseler et al., 2007). The latent variable scores are applied later in the next stage as indicants in a separate higher-order structural model analysis. Accordingly, a Two-Stage Approach is typical of how researcher already utilized factor scores before running additional regression analyses.

Using Two-Stage Approach, the higher-order constructs are directly measured by manifest indicators for the first-order constructs (Henseler et al., 2007). First, the five variables of Diversity of Measurement served as the first-order latent variables in which corresponding manifest variables (i.e., measurement items which survived the EFA) were related to their respective first-order construct using a reflective mode (Edwards & Bagozzi, 2000). In other words, the measurement model of each first-order constructs, namely financial measures, customer measures, internal business process measures, learning and growth measures, and social & environmental measures was calculated firstly. Second, the scores of the first-order latent variable constructs were saved to serve as the manifest variables for the DM construct. Ultimately, the Diversity of Measurement construct was prepared for the main measurement model assessment in PLS.

5.5.2 Partial Aggregation for the Balanced Use of Diagnostic and Interactive PMS Construct

The partial aggregation technique embodies the aggregation of the indicators of each dimension of the overall construct, through which each separate underlying factor is retained (Bagozzi & Heatherton, 1994). In this situation, a composite variable is established from the items of each separate dimension of the construct and become single indicators of a single factor model. SEM confirmatory factor analysis (CFA) can be conducted afterwards to estimate an overall model. Failure to reject this model implies that each of the composite variables measure a single construct (Bagozzi & Heatherton, 1994). This method to model estimation offers larger substantive content for each variable within a smaller matrix, less distraction from accumulated errors and, thus, superior reliability (Bentler & Wu, 1995; Loehlin, 2012). Baumgartner and Homburg (1996) suggested that these composites be established from scales for which unidimensionality and reliability are developed. Partial aggregation is widely applied to estimate complicated models. For example, Morgan and Hunt assess their commitment-trust theory of relationship marketing (Morgan & Hunt, 1994).

Henri (2006a) operationalized balanced use of PMS as a product term between diagnostic and interactive PMS use. According to Henri (2006a, p. 541), “a product term is treated as a construct having its own theoretical meaning… it can be treated as a variable without any theoretical meaning (to test an interaction) or as a construct based on a theoretical justification”. There are some methods in SEM which enable researcher to generate and estimate multiplicative terms. Following the Henri (2006a), the interaction of diagnostic and interactive PMS use is treated as the PMS Use (Balanced Use of Diagnostic and Interactive PMS) in the current

study. In the interaction method, the items of each construct should be multiplied with each other. In this case, the items of diagnostic PMS use (four items) and interactive PMS use (seven items) were multiplied. Concerning the 28 manifest variables for the balanced use of PMS construct, the partial aggregation method, as explained at the outset of this section, was utilized to reduce the number of items (Bagozzi & Edwards, 1998; von der Heidt & Scott, 2007). Each seven items (multiplication of a diagnostic item and interactive items) were examined for reliability and unidimensionality (percent of extracted variance for the only one factor). The summary of results is presented in Table 5.7. The more detailed calculations in that regard are presented in Appendix (D).

Table 5.7 Reliability and unidimensionality of the Balanced Use of PMS construct

Diagnostic & Interactive Joint Effect	Unidimensionality	Reliability
Diag1*(Int1- Int7)	95.188	.991
Diag2*(Int1- Int7)	94.735	.991
Diag3*(Int1- Int7)	95.040	.991
Diag4*(Int1- Int7)	95.545	.992
Diag: Diagnostic PMS Use includes 4 items; **Int**: Interactive PMS Use includes 7 items		

Given that all four groups were highly reliable and unidimensional, the average of each group was calculated as a manifest variable of balanced use of PMS.

5.5.3 The Main Measurement Model Assessment

Unidimensionality is presented by composite reliabilities of the constructs that are shown in Table 5.9. The reliability level is desirable at 0.8 for the basic study while it is acceptable at 0.7 for the exploratory study (Hair, Anderson, Tatham, & Black, 1998). An internal consistency measure (Cronbach α) developed by Fornell and Larcker (1981), and composite reliability calculated by Bacon,

Sauer, and Young (1995), are typically reported. The composite reliability in mathematical form is the sum of the square of standardized loadings divided by the summation of the sum of the square of standardized loadings and measurement errors of indicators (Hair et al., 1998). It is similar to Cronbach's alpha (Barclay et al., 1995) and can be similarly interpreted. Among 9 constructs, 5 constructs have a Cronbach's α in the 0.90s, and three constructs (human capital, social capital, and diversity of measurement) are in the 0.80s. The composite reliabilities are shown in Table 5.9 range from 0.88 (social capital) to 1 (organizational culture) which are acceptable by the guideline suggested by Hair et al., (1998).

Construct validity can be assessed through the estimation of each measure's convergent, discriminant validity or factor loadings of each item in each construct. Construct, convergent and discriminant validity were demonstrated in several articles (e.g. Ko et al., 2005; Karimi et al., 2004; Teo et al., 2003; Chin et al., 2003; Chwelos et al., 2001). A publicly acknowledged rule of thumb is to accept items with loadings of 0.70 and higher, that implies that there is more shared variance between the construct and its measures than error variance (Barclay et al. 1995; Hair et al. 1998). According to Bollen (1989), the larger the factor loadings, the stronger the evidence of unidimensionality is. In this study, the factor loadings were all above 0.70 except for items SIC1, RIC1, RIC10, and OP10 which were in the 0.60s. These items were dropped in four iterations, in each iteration just one item was dropped, since their factor loadings were lower than 0.70. Eventually, the results became satisfactory following the carrying out of the second calculation of the overall measurement model and after deleting aforementioned items. In this respect, Figure 5.3 illustrates the measurement model or so-called outer model of this study which mainly includes loading between latent variables (circles) and their

corresponding items or better known as manifest variables (rectangles). Besides, as can be seen in Table 5.8, no significant cross loadings are found, thereby providing evidence of scale unidimensionality.

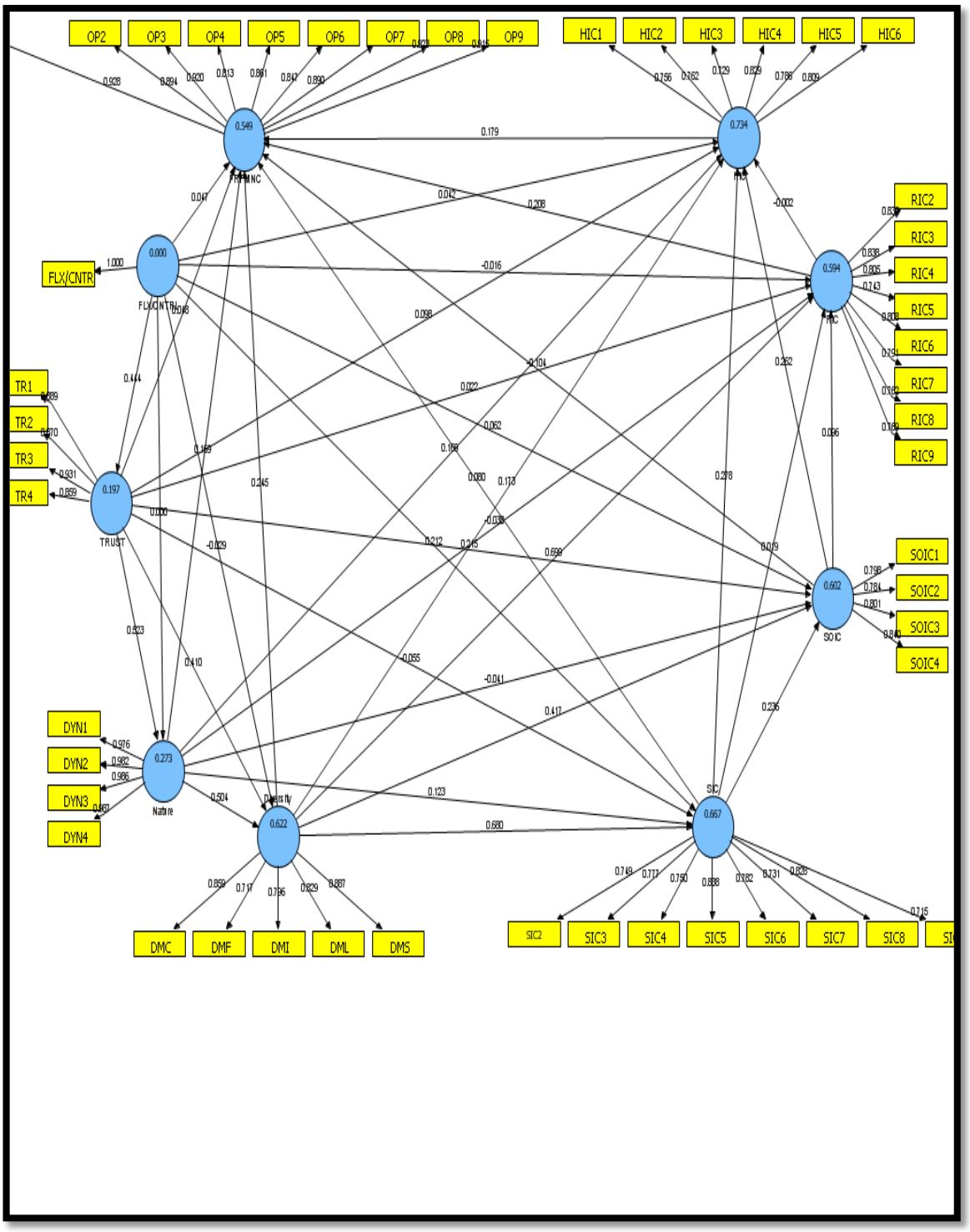


Figure 5.3
Measurement Model

Table 5.8 Confirmatory Factor Analysis

	Diversity	PMSU	CULT	HIC	PRFMNC	RIC	SIC	SOIC	TRUST
DMC	**0.8592**	0.5606	0.2559	0.6362	0.6451	0.7001	0.577	0.6186	0.5206
DMF	**0.717**	0.5136	0.1665	0.5853	0.5113	0.4626	0.5029	0.642	0.4693
DMI	**0.7962**	0.4359	0.082	0.5837	0.506	0.6413	0.6795	0.5187	0.4529
DML	**0.8286**	0.6415	0.1943	0.6637	0.574	0.6971	0.7739	0.5622	0.5544
DMS	**0.8875**	0.7295	0.3738	0.7149	0.6062	0.6296	0.683	0.6641	0.6842
DYN1	0.7088	**0.9758**	0.2072	0.6319	0.5972	0.5358	0.6204	0.5103	0.477
DYN2	0.6819	**0.9823**	0.2249	0.6516	0.5847	0.5105	0.6043	0.5082	0.5043
DYN3	0.6995	**0.9858**	0.25	0.6754	0.5932	0.5129	0.6278	0.5427	0.5426
DYN4	0.7063	**0.9872**	0.2292	0.6587	0.5985	0.5231	0.6117	0.5232	0.5295
CULT	0.2702	0.232	**1**	0.3756	0.2808	0.2156	0.4001	0.355	0.4435
HIC1	0.7065	0.6112	0.338	**0.7555**	0.4658	0.5196	0.6486	0.6501	0.6287
HIC2	0.6606	0.5861	0.2299	**0.7619**	0.3555	0.5028	0.533	0.6259	0.5657
HIC3	0.4274	0.3647	0.3167	**0.7291**	0.4806	0.4086	0.5598	0.4671	0.3839
HIC4	0.5807	0.5006	0.2386	**0.8287**	0.585	0.4716	0.5922	0.5426	0.3572
HIC5	0.558	0.4621	0.2846	**0.786**	0.5029	0.428	0.6156	0.56	0.4225
HIC6	0.6603	0.545	0.3403	**0.8091**	0.6108	0.5115	0.6345	0.6003	0.5676
OP1	0.6373	0.5716	0.3088	0.5873	**0.9279**	0.5941	0.5674	0.4872	0.5713
OP2	0.6443	0.5685	0.2585	0.5537	**0.8939**	0.5495	0.5176	0.4609	0.5211
OP3	0.698	0.6066	0.267	0.5911	**0.9199**	0.5848	0.5764	0.5142	0.547
OP4	0.5788	0.4874	0.2684	0.5582	**0.8134**	0.534	0.5102	0.4675	0.5065
OP5	0.6846	0.5598	0.2232	0.635	**0.8612**	0.564	0.6382	0.5073	0.4853
OP6	0.4565	0.428	0.2547	0.4785	**0.8471**	0.3975	0.4538	0.317	0.2528
OP7	0.5556	0.4176	0.1792	0.5065	**0.89**	0.525	0.5017	0.411	0.4052
OP8	0.5802	0.5118	0.2283	0.5838	**0.9227**	0.5365	0.5525	0.458	0.3972
OP9	0.6688	0.6226	0.2493	0.6113	**0.9155**	0.6005	0.6004	0.5351	0.4175
RIC2	0.6169	0.474	0.2101	0.4469	0.5966	**0.83**	0.4936	0.4501	0.5005
RIC3	0.5539	0.346	0.0438	0.4262	0.4922	**0.8383**	0.4499	0.452	0.3409
RIC4	0.5858	0.4452	0.2749	0.4733	0.5287	**0.8048**	0.5066	0.4276	0.4782
RIC5	0.5303	0.3572	0.1316	0.3711	0.4019	**0.743**	0.4483	0.2919	0.279
RIC6	0.7417	0.5129	0.1769	0.6469	0.6002	**0.8084**	0.6397	0.6099	0.4967
RIC7	0.5548	0.3192	0.075	0.3791	0.4139	**0.7908**	0.3889	0.4304	0.4779
RIC8	0.5178	0.3786	0.1135	0.4361	0.3213	**0.762**	0.3787	0.4628	0.2379
RIC9	0.6873	0.4608	0.2784	0.6083	0.4753	**0.7686**	0.5287	0.6419	0.4494

Table 5.8 Confirmatory Factor Analysis (continued)

	Diversity	PMSU	CULT	HIC	PRFMNC	RIC	SIC	SOIC	TRUST
SIC2	0.6578	0.5252	0.2456	0.6747	0.4666	0.5116	**0.7493**	0.6189	0.4973
SIC3	0.5405	0.3781	0.3175	0.6395	0.5147	0.4442	**0.7772**	0.5776	0.4382
SIC4	0.5215	0.402	0.3076	0.5694	0.3309	0.3477	**0.7504**	0.4483	0.3061
SIC5	0.6075	0.4099	0.2797	0.6179	0.4329	0.5058	**0.838**	0.5352	0.3307
SIC6	0.5139	0.3727	0.306	0.6125	0.3789	0.3674	**0.782**	0.5512	0.2939
SIC7	0.5986	0.5883	0.3399	0.5376	0.5199	0.4683	**0.7313**	0.4508	0.4586
SIC8	0.7302	0.5845	0.3928	0.6259	0.6288	0.6099	**0.8278**	0.5747	0.5685
SIC9	0.6476	0.5603	0.2704	0.4629	0.4908	0.4967	**0.7148**	0.435	0.4495
SOIC1	0.625	0.4334	0.1953	0.5882	0.5307	0.6897	0.4491	**0.7978**	0.5667
SOIC2	0.664	0.588	0.4838	0.7194	0.4504	0.4823	0.7329	**0.7837**	0.5496
SOIC3	0.5207	0.3019	0.1312	0.5057	0.3302	0.4122	0.4657	**0.8014**	0.4109
SOIC4	0.4997	0.305	0.2649	0.524	0.3365	0.317	0.4906	**0.8399**	0.4483
TR1	0.6242	0.474	0.2228	0.5724	0.5964	0.5942	0.4863	0.5305	**0.889**
TR2	0.4822	0.3619	0.3919	0.4503	0.4573	0.3315	0.3924	0.4532	**0.8702**
TR3	0.6355	0.4965	0.4806	0.5986	0.4431	0.4858	0.5214	0.65	**0.931**
TR4	0.5841	0.5042	0.4779	0.6193	0.3569	0.4349	0.5447	0.5711	**0.8592**

Convergent validity is defined as the extent to which constructs which must be associated theoretically are actually interrelated (Campbell & Fiske, 1959) whereas discriminant validity is defined as the extent to which constructs which must not be associated theoretically are not interrelated in effect (Campbell & Fiske, 1959). Convergent validity is obtained when the average variance extracted (AVE) between the constructs exceeds 0.5 (Chin et al., 1998). AVE provides a measure of the variance shared between a construct and its indicators. In Table 5.9, the lowest AVEs (0.5969 & 0.6074) contribute to Human capital (HIC) and Structural Capital (SIC), and other constructs have their ranges between 0.6302 (Relational Capital /RIC) and 1(organizational culture).

Table 5.9 Reliability and Convergent Validity Results

Constructs	Average Variance Extracted (AVE)	Composite Reliability	Cronbach's Alpha
Organizational Culture	1	1	1
Trust	0.7881	0.937	0.9103
Human Capital (HIC)	0.6074	0.9024	0.8706
Structural Capital (SIC)	0.5967	0.9219	0.9032
Relational Capital (RIC)	0.6302	0.9316	0.9164
Social Capital (SOIC)	0.6496	0.8811	0.8235
Diversity of Measurement (DM)	0.6721	0.9107	0.8765
Balanced PMS Use (PMSU)	0.9659	0.9912	0.9882
Organizational Performance (OP)	0.7898	0.9712	0.9666

This research drew upon the suggestion of Fornell and Larker (1981) in order to assess discriminant validity: the square root of AVE must be larger than the correlations of the constructs to achieve acceptable discriminant validity. Hence, the value of diagonal elements must be higher than those of off-diagonal elements (Fornell & Larcker, 1981; Hulland, 1999). As a result, the values presented in Table 5.10 shows acceptable discriminant validity.

Table 5.10 Discriminant Validity

Variables	Culture	Trust	HIC	SIC	RIC	SOIC	DM	PMSU	OP
Culture	***1***								
Trust	0.443	***0.887***							
HIC	0.376	0.637	***0.779***						
SIC	0.400	0.553	0.769	***0.773***					
RIC	0.216	0.527	0.612	0.617	***0.794***				
SOIC	0.355	0.627	0.742	0.682	0.610	***0.806***			
DM	0.270	0.661	0.778	0.788	0.768	0.732	***0.820***		
PMSU	0.232	0.523	0.665	0.626	0.530	0.530	0.710	***0.983***	
OP	0.281	0.522	0.643	0.619	0.615	0.526	0.695	0.604	***0.889***
HIC: Human capital, SIC: Structural Capital, RIC: Relational Capital; SOIC: Social Capital, DM: Diversity of Measurement, PMSU: Balanced PMS Use, OP: Organizational Performance									

5.5.4 Common Method Bias

In self-report studies, one of the major issues regarding measurement validity is common method bias. Common method bias typically occurs since the key informant approach is utilized to gain measurement scores for the all constructs. Although several efforts have been conducted to reduce such bias during the instrument development stage, such as replacing outcome-related items with specific and more procedural items, modifying item wordings to avoid social desirability, the potential common method variance may not be completely eliminated.

In this study, suitable technique i.e. single-factor test was carried out for evaluating whether common method bias is a serious issue or not. According to Podsakoff, MacKenzie, Lee, and Podsakoff (2003), Harman's one-factor or so-called single-factor test (Harman, 1976) is one of the most frequently used methods which enable researcher to deal with the problem of common method bias. In this respect, exploratory factor analysis (EFA) was conducted for all variables of interest in the research (Jarvis, MacKenzie, & Podsakoff, 2003; Koh, Ang, & Straub, 2004). The results of this test on all the constructs demonstrated one factor with eigenvalues higher than 1 and no single factor emerged from the unrotated factor solution and accounted for the majority of the variance among variables. The first extracted factor accounted for by only 45.137 of the variance which is acceptable (see appendix C-3 for more details).

5.6 Assessing Structural Model / Hypotheses Testing

In PLS path modeling, the structural model is assessed through estimating the path coefficients along with the R^2 value. While path coefficients show the strength

of the associations among the predictor and criterion constructs, the R^2 value is a scale of the predictive intensity of a model for the criterion (dependent) constructs (Ko et al., 2005; Chin et al., 1998, 2003). The significance of path coefficients in the model lends support for hypothesized associations (Bentler, 1989). SMARTPLS V2.0 M3 (Ringle et al., 2005), was chosen to use a bootstrap resampling method (5000 resamples) to determine the significance of the paths within the structural model. Figure 5.4 and Table 5.11 demonstrate results of the SEM assessment which consists of standardized path coefficients β in addition to their corresponding t-statistics extracted from PLS estimation. The bootstrap resampling technique with 5000 resamples was conducted for estimating the standard errors. R^2 scores show that the model explains a substantial amount of variance in the dependent variables. The findings also lend support for the hypothesized mediating role of “Diversity of Measurement” and also “Balanced PMS Use” between the four individual components of “Intellectual Capital” and “Organizational Performance”. Table 5.11 summarizes hypotheses (direct effects) and their test results. Most paths are significant.

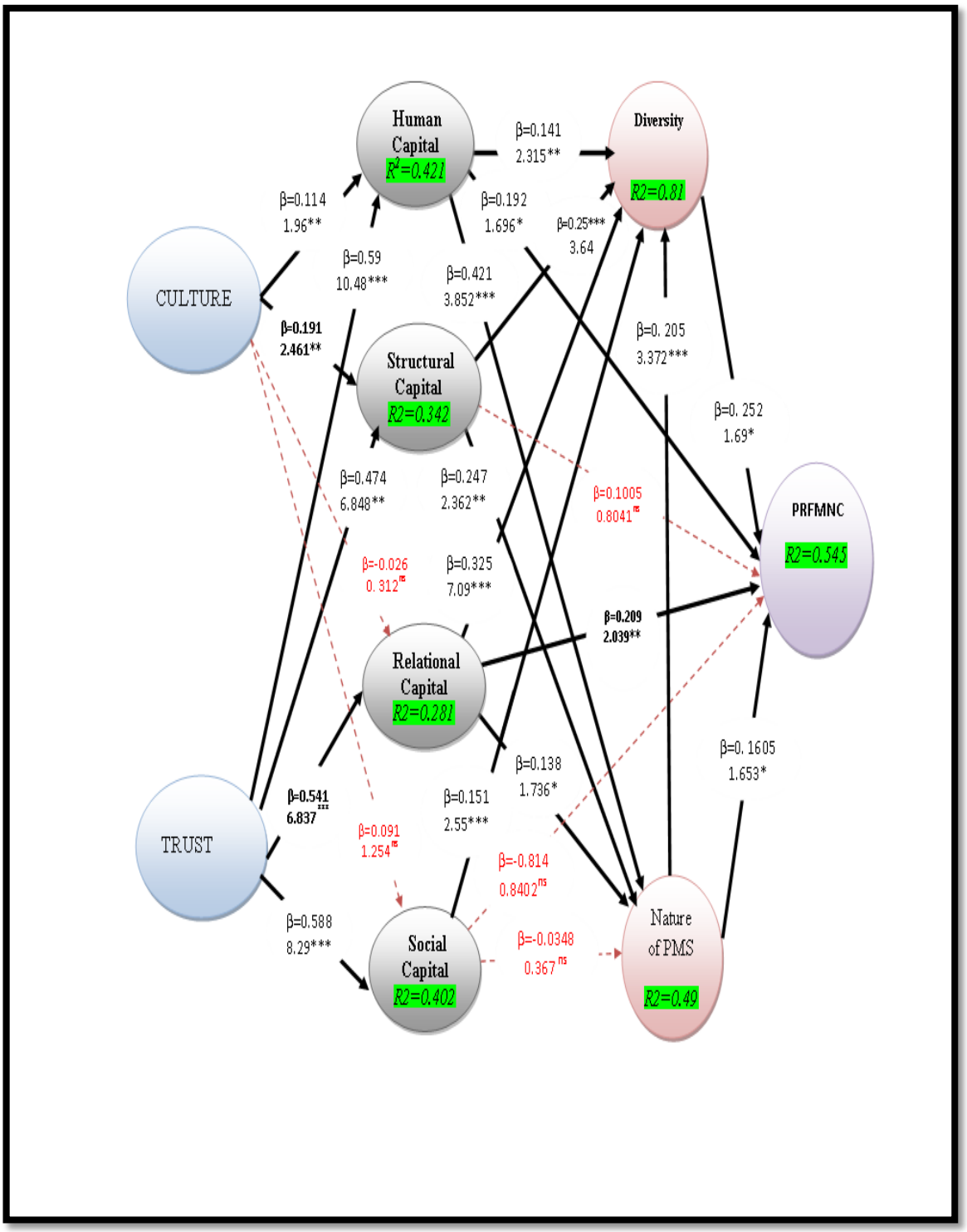


Figure 5.4
Results of the Proposed Research Model

1. The path coefficients β are shown above with their corresponding t critical value below. *p<0.1 level (n =128, t critical value =1.65); **p<0.05 level (n =128, t critical value =1.96; ***p<0.01 level (n =128, t critical value =2.58)
2. The **bold black** lines indicate **significant** paths, and the **dotted red** arrows indicate **insignificant** paths.

Table 5.11 Results of the Structural Equation Model Estimation (Direct Paths)

No.	Hypothesis	Path	Parameter Estimate (β)	Sample Mean	Standard Error	T Statistics
1	H1a	Culture --> HIC	**0.113****	0.1124	0.058	**1.9574**
2	H1b	Culture --> SIC	**0.191****	0.1907	0.0776	**2.4616**
3	H1c	Culture --> RIC	ns -0.026	-0.0297	0.0831	0.3128
4	H1d	Culture --> SOIC	ns 0.0915	0.0913	0.0729	1.2549
5	H2a	Trust --> HIC	**0.5905*****	0.5939	0.0563	**10.4888**
6	H2b	Trust --> SIC	**0.4748*****	0.4781	0.0693	**6.8488**
7	H2c	Trust --> RIC	**0.5415*****	0.5477	0.0792	**6.8372**
8	H2d	Trust --> SOIC	**0.5883*****	0.5906	0.0709	**8.2947**
9	H3a	HIC --> PRFMNC	**0.1926***	0.2016	0.1135	**1.6963**
10	H3b	SIC --> PRFMNC	ns 0.1005	0.0947	0.125	0.8041
11	H3c	RIC --> PRFMNC	**0.2094****	0.2097	0.1027	**2.0395**
12	H3d	SOIC --> PRFMNC	ns -0.0814	-0.0892	0.0969	0.8402
13	H4a	HIC --> Diversity	**0.1412****	0.1409	0.061	**2.3157**
14	H4b	SIC --> Diversity	**0.2503*****	0.2493	0.0687	**3.6445**
15	H4c	RIC --> Diversity	**0.3252*****	0.3263	0.0458	**7.0958**
16	H4d	SOIC --> Diversity	**0.1506*****	0.1482	0.0589	**2.5582**
17	H5a	HIC --> PMS use	**0.4209*****	0.4139	0.1092	**3.8526**
18	H5b	SIC --> PMS use	**0.2471****	0.2494	0.1046	**2.3624**
19	H5c	RIC --> PMS use	**0.1386***	0.1395	0.0798	**1.7361**
20	H5d	SOIC --> PMS use	ns -0.0348	-0.0294	0.0948	0.3676
21	H6	Diversity --> PRFMNC	**0.252***	0.2588	0.1489	**1.6916**
22	H7	PMS use --> PRFMNC	**0.1605***	0.1594	0.0971	**1.653**
23	H8	PMS use --> Diversity	**0.2057*****	0.2079	0.061	**3.3728**
24	***Control V.***	Size --> PRFMNC	ns -0.0158	-0.0154	0.0649	0.2437
25	***Control V.***	Industry- -> PRFMNC	ns 0.038	0.0369	0.0688	0.5528

***** p<0.01; ** p<0.05; * p<0.1; *ns not significant***

5.6.1 Direct Effects

As can be seen in Table 5.11 as well as Figure 5.4, this research examined hypotheses 1 (1a, 1b, 1c, 1d), 2 (2a, 2b, 2c, 2d), 3 (3a, 3b, 3c, 3d), 4 (4a, 4b, 4c, 4d), 5 (5a, 5b, 5c, 5d), 6, 7, and 8 with the direct effects model. First, hypotheses

1a, 1b, 1c, 1d explored the linkage among organizational culture (in terms of control/flexibility continuum, i.e. dominant type) and four components of intellectual capital (i.e. human capital, structural capital, relational capital, and social capital respectively). In the same vein, hypotheses 2a, 2b, 2c, 2d investigated the association between organizational trust and four components of intellectual capital (IC). Hypotheses 3a, 3b, 3c, 3d examined a direct relationship between the four components of IC and organizational performance. Hypotheses 4a, 4b, 4c, and 4d examined a direct relationship between the four IC components and diversity of measurement. Hypotheses 5a, 5b, 5c, and 5d also examined a direct relationship between the four IC components and the balanced use of PMS. Hypothesis 6 explored the direct association between diversity of measurement and organizational performance, whereas hypothesis 7 investigated the direct relationship between the balanced use of PMS and organizational performance. Finally, hypothesis 8 examined a direct relationship between the balanced use of PMS and diversity of measurement in this study.

The standardized coefficient of the effect of organizational culture on human capital and structural capital provides support for hypothesis H1a and H1b respectively. That is, culture (flexibility dominant cultural type) has a positive impact on human capital with a path coefficient of 0.113, t-value 1.957 and significant at $p < 0.05$ (H1a). 42% of the variance in human capital is explained by Culture and Trust. Similarly, there is a significant relationship between culture and the structural capital with a path coefficient of 0.191, t-value 2.46 and significant at $p < 0.05$ (H1b). 34% variance in structural capital is explained by Culture and Trust. Conversely, the results do not support hypotheses H1c and H1d since no

statistical significance was found between culture and relational capital (β=-0.026) and social capital (β=0.0915).

Besides, the data analysis revealed that there is a significant positive association between the level of trust and the four components of IC (i.e. human capital, structural capital, relational capital, and social capital), supporting hypotheses 2a (β=0.5905, t=10.48, $p < 0.01$), 2b (β=0.4748, t=6.848, $p < 0.01$), 2c (β=0.5415, t=6.837, $p < 0.01$), 2d (β=0.5883, t=8.294, $p < 0.01$) respectively.

The results of the research confirm that human capital positively affects organizational performance, which supports the hypothesis 3a: The higher the level of human capital, the higher is the organizational performance level. The results indicate there is statistical significance to this positive relationship, with a path coefficient of 0.192 and t-score of 1.69 at a 0.1 level of significance. The results also reveal that there is a positive association between relational capital and organizational performance, which supports hypothesis 3c: The higher the level of relational capital, the higher is the organizational performance level. The results show there is a statically significant positive relationship between the path coefficient of 0.209 and t-score of 2.039 at a 0.05 level. However, the results do not support hypothesis 3b: The higher the level of structural capital, the higher is the organizational performance level. No statistical significance was found between structural capital and organizational performance (β=0.1005). Similarly, there is no significant relationship between social capital and organizational performance (β=-0.0814) which does not support hypothesis 3d: The higher the level of social capital, the higher is the organizational performance level.

The data analysis results show that there is a significant positive association between the level of human capital and the extent of diversity of measurement usage, supporting the hypothesis 4a: The higher the level of human capital, the higher is the diversity of measurement. A statistically positive relationship was found with a path coefficient of 0.141 and a t-score of 2.315 at a 0.05 level. Hypothesis 4b, the higher the level of structural capital, the higher is the diversity of measurement, was also supported by the research results as there is a significant positive association between the level of structural capital and the extent of diversity of measurement usage. The path coefficient was 0.25 and the t-score was 3.644 at a 0.01 level significance. Also, the research results support hypothesis 4c: the higher the level of relational capital, the higher is the diversity of measurement, as a positive relationship between relational capital and the extent of diversity of measurement usage was shown. A path coefficient of 0.325 with t-score of 7.09 indicated a statistically positive relationship at a 0.01 level significance. Similarly, the data analysis results confirm that there is a significant positive association between the level of social capital and the extent of diversity of measurement usage, supporting the hypothesis 4d: The higher the level of social capital, the higher is the diversity of measurement. The path coefficient was 0.1506 and the t-score was 2.558 at a 0.01 level significance.

This research found a statistically significant positive relationship between the level of human capital and the balanced use of PMS, providing evidence for hypotheses 5a ($\beta=0.421$, $p < 0.01$) with t-statistics of 3.852. Likewise, the results of the analysis indicate that there is a significant positive association between the level of structural capital and the balanced use of PMS, offering evidence for hypotheses 5b ($\beta=0.247$, $p<0.05$) with the t-score of 2.362. In the same vein, a statistically

positive relationship was found between level of relational capital and the balanced use of PMS with a path coefficient of 0.138 and t-score of 1.736 at a 0.1 level of significance which consequently provides support for the hypothesis 5c: there is an association between the level of relational capital and the balanced use of PMS. Conversely, this research found no statistical significance between the level of social capital and the balanced use of PMS (β=-0.0348). Accordingly, the research results do not support hypothesis 5d: there is an association between the level of social capital and the balanced use of PMS.

R^2 in diversity of measurement for the structural model was 81.4%, which was explained by the following factors: culture, trust, human capital, structural capital, relational capital, social capital and the balanced use of PMS. That is, altogether, 81.4% of the variance in diversity of measurement was explained by the aforementioned independent variables. Likewise, R^2 in the balanced use of PMS for the structural model was 49.3%, which was explained by the following factors: culture, trust human capital, structural capital, relational capital, and social capital. In other words, overall, 49.3% of the variance in balanced use of PMS was explained by the aforesaid independent variables.

As hypothesized, organizational performance is significantly associated with diversity of measurement (β=0.252, $p < 0.1$) and the balanced use of PMS (β=0.1605, $p < 0.1$), which in turn offering support for hypothesis 6: The higher the diversity of measurement, the higher is the organizational performance, as well as hypothesis 7: there is an association between the balanced use of PMS and organizational performance. In sum, 54.5% of organizational performance was explained by the above two variables (diversity of measurement and the balanced

use of PMS), four intellectual capital components, and plus culture and trust. Put differently, R^2 in organizational performance for the structural model was 54.5% which was explained by the eight aforesaid variables. Finally, the research results confirm that the balanced use of PMS positively influence diversity of measurement, which in turn supports hypothesis 8: there is an association between the balanced use of PMS and the extent diversity of measurement. A statistically positive relationship was established, with a path coefficient of 0.2057 and t-score of 3.372 at a 0.01 level. The summary of the results of hypotheses testing are presented in Table 5.12 below.

Table 5.12 Results of hypotheses testing (Direct Paths)

No	Hypotheses		Results
1	H1a	There is an association between the organizational culture and the human capital.	Supported
2	H1b	There is an association between the organizational culture and the structural capital.	Supported
3	H1c	There is an association between the organizational culture and the relational capital.	**Not supported**
4	H1d	There is an association between the organizational culture and the social capital.	**Not supported**
5	H2a	The greater the level of trust, the higher is the level of human capital.	Supported
6	H2b	The greater the level of trust, the higher is the level of structural capital.	Supported
7	H2c	The greater the level of trust, the higher is the level of relational capital.	Supported
8	H2d	The greater the level of trust, the higher is the level of social capital.	Supported
9	H3a	The higher the level of Human Capital, the higher is the organizational performance level.	Supported
10	H3b	The higher the level of Structural Capital, the higher is the organizational performance level.	**Not supported**
11	H3c	The higher the level of Relational Capital, the higher is the organizational performance level.	Supported
12	H3d	The higher the level of Social Capital, the higher is the organizational performance level.	**Not supported**
13	H4a	The higher the level of human capital, the higher is the diversity of measurement.	Supported
14	H4b	The higher the level of structural capital, the higher is the diversity of measurement.	Supported
15	H4c	The higher the level of relational capital, the higher is the diversity of measurement.	Supported
16	H4c	The higher the level of social capital, the higher is the diversity of measurement.	Supported
17	H5a	The higher the level of human capital, the higher is the balanced use of diagnostic and interactive PMS.	Supported
18	H5b	The higher the level of structural capital, the higher is the balanced use of diagnostic and interactive PMS.	Supported
19	H5c	The higher the level of relational capital, the higher is the balanced use of diagnostic and interactive PMS.	Supported
20	H5d	The higher the level of social capital, the higher is the balanced use of diagnostic and interactive PMS.	**Not supported**
21	H6	The higher the diversity of measurement, the higher is the organizational performance.	Supported
22	H7	The greater the balanced use of interactive and diagnostic PMS, the higher is the organizational performance.	Supported
23	H8	The greater the balanced use of interactive and diagnostic PMS, the higher is the diversity of measurement.	Supported

5.6.2 Indirect Effects

This study relies specifically on a recent technical literature in order to test the mediation hypotheses. Generally, tests of mediation utilize the suggested four-step procedure introduced in Baron and Kenny's classic publication (Baron & Kenny, 1986). Nevertheless, more recent investigations of mediation methods have detected some shortcomings in this method and there is broad concurrence currently about amended recommendations for best practices in testing mediating effect (Hayes, 2009; MacKinnon, Fairchild, & Fritz, 2007; Shrout & Bolger, 2002; Zhao, Lynch, & Chen, 2010). In other words, this literature questions the famous and frequently used Baron and Kenny (1986) tests for mediation while highlighting the supremacy of bootstrap process for statistical analysis. Two conclusions are drawn from the foregoing literature which is specifically pertinent to the analysis in the context of the current study.

The first conclusion involves Barron and Kenny (1986). They specify three tests for establishing mediation resulting from three separate regressions. Drawing from the viewpoint of Barron and Kenny (1986), Coltman, Devinney, and Midgley (2011, p. 21) argued that mediation occurs in the following conditions:

1) A regression of the mediator on the dependent variable shows a significant effect;
2) A regression of the independent variable on the dependent variable—often called the effect to be mediated—shows a significant effect; and
3) A regression in which both independent variable and mediator have a significant effect on the dependent variable

Some recent scholars have discussed that there is no need to carry out the second test and it could be potentially misleading due to the fact that it confounds

the direct effect with the total effects of the model (e.g. Kenny et al., 1998; McKinnon et al., 2000). As a result, drawing upon the review of the foregoing and other relevant literature, Zhao et al (2010, p. 204) asserted that for demonstrating mediation “all that matters is that the indirect effect is significant”.

The second conclusion from this literature is related to the issue of indicating the indirect effect is significant. Based on Barron and Kenny view again, and conventionally, the Sobel test has been utilized in that regard. Nevertheless, Sobel test technique has been widely criticized by several scholars for its adequacy due largely to its normality assumption (Zhao et al., 2010). As Coltman et al. (2011, p. 22) argued, “the indirect path involves the product of two coefficients whose sampling distribution is only normal for large samples and not those typically seen in research studies”. Alternatively, Preacher and Hayes (2008) suggested a bootstrap test, specifically when the model embraces the simultaneous test of more than one mediator, as the case in the current study. Simulation studies have demonstrated the superiority of the bootstrapping over the product of coefficients view or the Sobel test and the most widely adopted Baron and Kenny (1986) causal steps technique with regard to statistical supremacy while retaining plausible control over Type I error (MacKinnon et al., 2007; Williams & MacKinnon, 2008). Accordingly, the recommended 5000 bootstrap samples were performed in order to test the mediating effects in this study. Overall, the results revealed that the 95% bootstrap confidence intervals for the total effects and those of Diversity of Measurement and the balanced use of PMS (two mediating variables of the current research) were all positive and did not include zero. The related results of mediation model are thoroughly presented in Table 5.12 along with the detailed descriptions on them after introducing the Zhao’s framework below.

As explained above, the decision tree and a step-by-step procedure for testing mediation from Zhao et al. (2010) are employed in order to examine the indirect effects in this study (Figure 5.5 and 5.6). Figure 5.5 is an illustration of a mediator model. As can be seen, the direct effect of the independent variable (IV) towards the assumed mediator is depicted with path ‘a’, while the direct effect of the assumed mediator into the dependent variable (DV) is shown with path ‘b’. The indirect path is derived from the interaction between path ‘a’ and ‘b’. This implies the path where mediation through the assumed mediator is established. Besides, path c illustrates the direct effect of the IV on the DV (Zhao et al., 2010).

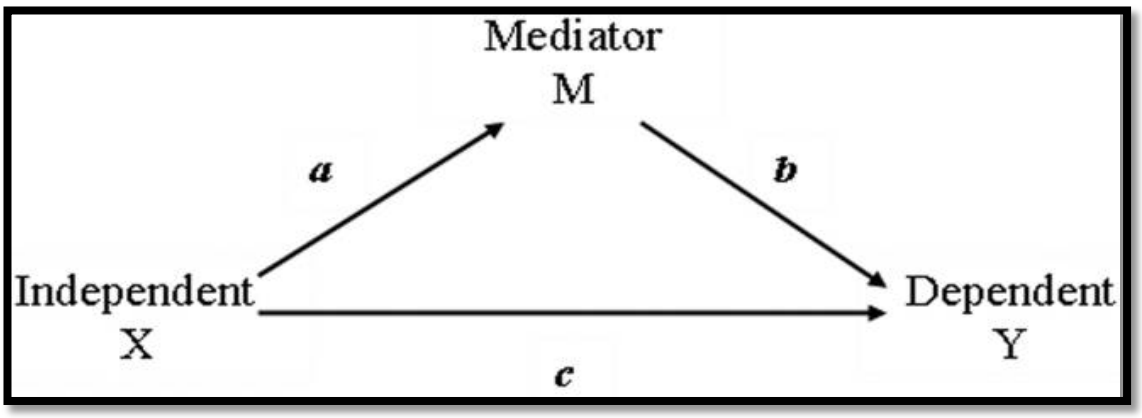


Figure 5.5
A three-variable nonrecursive causal model (Zhao et al., 2010, p. 198)

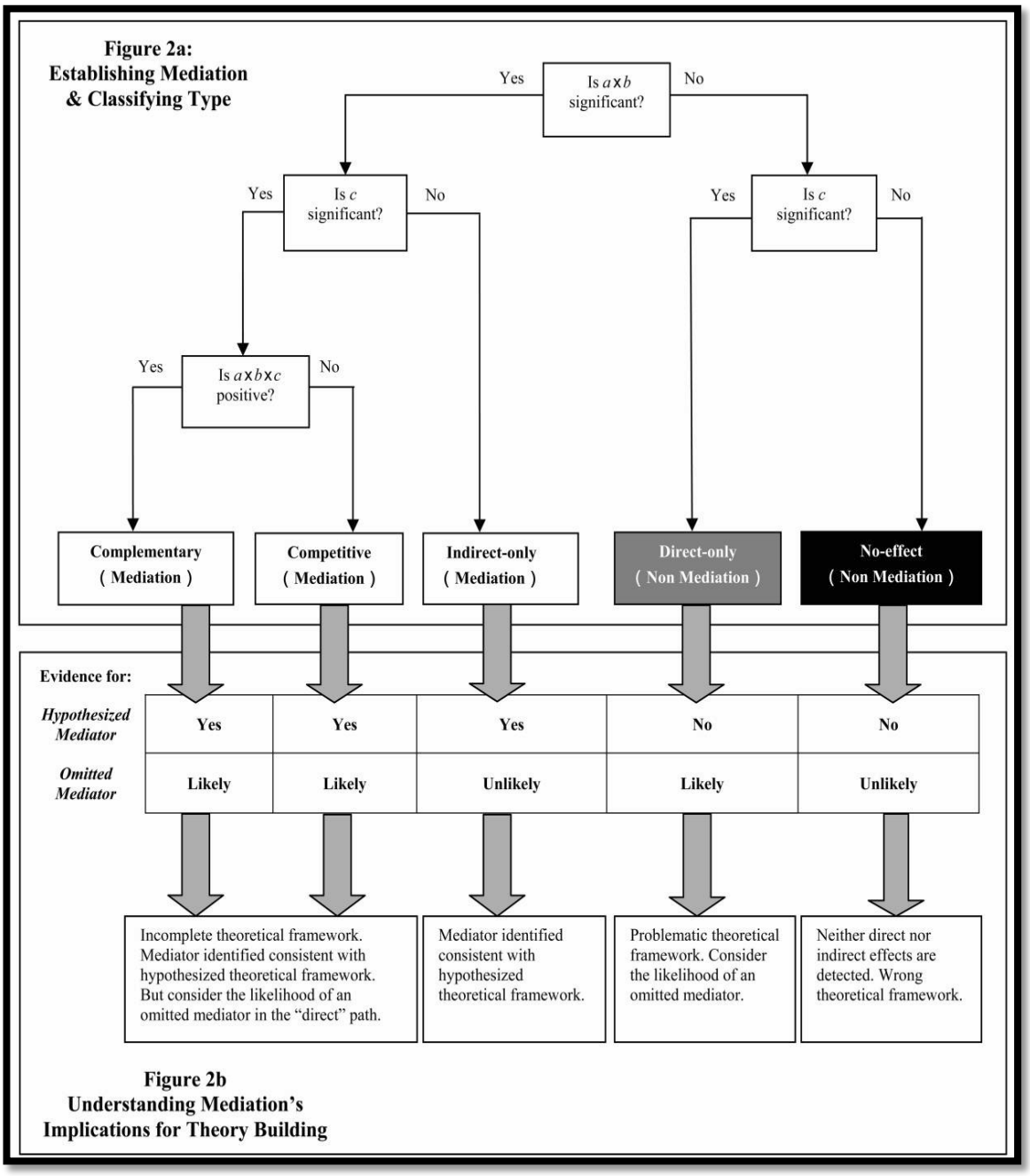


Figure 5.6
Decision tree for establishing and understanding types of mediation and nonmediation (Zhao et al., 2010, p. 201)

As presented in Table 5.12, Bootstrapping the model with the diversity of measurement as mediating variable resulted in a 95% confidence interval (0.033, 0.034) for the indirect effect of human capital on organizational performance. This confidence interval does not include zero, so the indirect effect a x b (0.0333) is significant and mediation through diversity of measurement is established. The

direct effect c (0.192*) is also significant ($p<0.1$). Since a x b x c is positive, it is a complementary mediation (partial mediation) according to the “Decision tree for establishing and understanding types of mediation and nonmediation” (Zhao et al., 2010, p. 201) (Figure 5.4). This means the mediated effect (a x b) and the direct effect (c) both exist and point in the same direction. Hypothesis 9a (diversity of measurement mediates the relationship between human capital and organizational performance) is consequently supported. As can be seen in the Zhao’s model, mediation is strongest when there is an indirect effect but no direct effect, which indicates indirect-only mediation or so-called full mediation. On the other hand, the mediation is termed complementary or partial mediation when there are both indirect and direct effects.

Again, bootstrapping the model with diversity of measurement as mediating variable resulted in a 95% confidence interval (0.062, 0.064) for the indirect effect of structural capital on organizational performance. This confidence interval does not include zero, so the indirect effect a x b (0.0627) is significant and mediation through diversity of measurement is determined. However, the direct effect c (0.1005) is not significant. In this case, indirect-only mediation (based on Zhao’s decision tree) or full mediation is established which consequently lends support to hypothesis 9b: diversity of measurement mediates the relationship between structural capital and organizational performance.

The procedure of bootstrapping for the purpose of exploring the indirect effect of relational capital on organizational performance through diversity of measurement revealed a 95% confidence interval (0.079, 0.081). This confidence interval does not include zero, so the indirect effect a x b (0.0797) is significant and

therefore mediation through diversity of measurement is confirmed. The direct effect c (0.209**) is significant as well ($p<0.05$). Accordingly, the complementary mediation (partial mediation) is established as a x b x c is positive. Hypothesis 9c (diversity of measurement mediates the relationship between relational capital and organizational performance) is also supported.

Concerning the mediating effect of diversity of measurement in the relationship between social capital and organizational performance, the results showed that the 95% bootstrap confidence intervals was not include zero (0.039, 0.041). Hence, the indirect effect a x b (0.0400) is significant which in turn leads to establishing the mediation effect. Hypothesis 9d (diversity of measurement mediates the relationship between social capital and organizational performance) is supported consequently. This mediation is indirect-only mediation or full mediation since the direct effect c (the path between social capital and organizational performance) is not significant (-0.0814).

On the other hand, bootstrapping the model with the balanced use of PMS as mediating variable resulted in a 95% confidence interval (0.065, 0.068) for the indirect effect of human capital on organizational performance. This confidence interval does not include zero, so the indirect effect a x b (0.0663) is significant and mediation through the balanced use of PMS is established. The direct effect c (0.192*) is also significant ($p<0.1$). Complementary mediation (partial mediation) is established because a x b x c is positive. This implies either the mediated effect (a x b) or the direct effect (c) exist and point in the same direction. Hypothesis 10a (the balanced use of PMS mediates the relationship between human capital and organizational performance) is consequently supported.

In a similar vein, bootstrapping the model with the balanced use of PMS as mediating variable indicated a 95% confidence interval (0.043, 0.044) for the indirect effect of structural capital on organizational performance. This confidence interval also does not include zero, so the indirect effect a x b (0.0435) is significant and mediation through the balanced use of PMS is established. As mentioned earlier, the direct effect c, i.e. the path of structural capital to organizational performance (0.1005) is not significant which in turn represents the indirect-only mediation or full mediation. Hypothesis 10b (the balanced use of PMS mediates the relationship between structural capital and organizational performance) is accordingly confirmed.

Finally, bootstrapping the model with nature of the balanced use of PMS as mediating variable resulted in a 95% confidence interval (0.023, 0.025) for the indirect effect of relational capital on organizational performance. This confidence interval does not include zero, so the indirect effect a x b (0.0239) is significant and consequently mediation through the balanced use of PMS is determined. The direct effect c (the path of relational capital to organizational performance) (0.209**) is also significant ($p<0.05$). The type of mediation is termed complementary mediation (partial mediation) due to the fact that a x b x c is positive. As a result, hypothesis 10c (the balanced use of PMS mediates the relationship between relational capital and organizational performance) is supported. Conversely, hypothesis 10d (the balanced use of PMS mediates the relationship between social capital and organizational performance) is not supported due to the fact that the initial condition for establishing the mediation effect was not fulfilled. That is, there

was no significant association between the independent variable (social capital) and mediating variable (the balanced use of PMS).

The summary of all these indirect effects which explained above as well as the summary of the results of hypotheses testing are presented in Table 5.13 and Table 5.14 below.

Table 5.13 Results of mediating model

Indirect effect – Hypothesis	Mean	Standard deviation	Lower bound of confidence interval	Upper bound of confidence interval	Type of mediation
HI-DM* DM - PRF (H9a)	0.0333	0.024	0.033	0.034	Complementary (Partial)
SI- DM * DM - PRF (H9b)	0.0627	0.039	0.062	0.064	Indirect-only (Full)
RI- DM * DM - PRF (H9c)	0.0797	0.043	0.079	0.081	Complementary (Partial)
S0- DM * DM - PRF (H9d)	0.0400	0.030	0.039	0.041	Indirect-only (Full)
HI-PMS USE* PMS USE *PRF (H10a)	0.0663	0.044	0.065	0.068	Complementary (Partial)
SI- PMS USE * PMS USE *PRF (H10b)	0.0435	0.032	0.043	0.044	Indirect-only (Full)
RI- PMS USE * PMS USE *PRF (H10c)	0.0239	0.022	0.023	0.025	Complementary (Partial)

Table 5.14 Results of hypothesis testing (Indirect Paths)

No	Hypotheses		Results
1	H9a	Diversity of measurement mediates the relationship between human capital and organizational performance	Supported
2	H9b	Diversity of measurement mediates the relationship between structural capital and organizational performance	Supported
3	H9c	Diversity of measurement mediates the relationship between relational capital and organizational performance	Supported
4	H9d	Diversity of measurement mediates the relationship between social capital and organizational performance	Supported
5	H10a	Balanced use of interactive and diagnostic PMS mediates the relationship between human capital and organizational performance	Supported
6	H10b	Balanced use of interactive and diagnostic PMS mediates the relationship between structural capital and organizational performance	Supported
7	H10c	Balanced use of interactive and diagnostic PMS mediates the relationship between relational capital and organizational performance	Supported
8	H10d	Balanced use of interactive and diagnostic PMS mediates the relationship between social capital and organizational performance	**Not supported**

5.7 Control Variables

Control variables are applied to account for factors in addition to the variables of interest in theoretical model, which are potentially able to explain variance in dependent variables. In this research, firm size and industry are considered as control variables since they are potentially able to influence organizational performance. Firm size reflects past success and may influence current performance (Aldrich & Auster, 1986). Large firms may suffer from increasing inertia and become less efficient and effective (Ranger-Moore, 1997). On the other hand, larger companies are often more powerful and have more resources than their small counterparts. It is also argued that larger business could derive greater benefits from intellectual capital leverage (Bontis, 2000). Thus, the potential effect of firm size on value creation of intellectual capital should be controlled to account for the variances attributable to firm size. Industry type is another important control variable affecting organizational performance. Companies from different industries

may vary in possessing intellectual capital as well as performance measurement system and then in realizing benefits from leveraging such value creation factors. Therefore, the potential effect of industry is needed to be controlled for.

As presented in Table 5.11 earlier, two control variables, namely size and industry were included in the model. The results indicated that firm size has non-significant effect on organizational performance (β=-0.0158, ns). Besides, the potential industry specific effect was tested by using a dummy variable ("1" means manufacturing, "0" means non-manufacturing). The manufacturing dummy variable had no significant effect on the dependent variables, (β=-0.038, ns), which indicates industry has no effect on firm performance (see Table 5.11, Results of the Structural Equation Model Estimation, for further details).

5.8 Summary

This chapter mainly presents the details of data analysis to assess measurement model and structural model simultaneously by using PLS-SEM analysis. This method is apposite to the current research due to its capability to handle a relatively small sample size for structural model estimation. However, it has its own implications. For example, "PLS tends to overestimate the measurement paths" that connect constructs to their indicators whereas it is inclined to underestimate the structural paths that are positively biased towards their loading estimates (Chin et al. 2003, p. 205).

The data collection process, response rate, and response bias analysis were firstly presented. Next, collected data were prepared for analysis through performing data coding, data screening and checking as well as the normality test.

This followed by the report on the profile of the respondents. The confirmatory factor analysis was conducted for the Diversity of Measurement construct through using two-step approach. Subsequently, the partial aggregation approach was applied in order to examine reliability and unidimensionality of the balanced use of PMS (Henry, 2006a). The main measurement model was assessed through analyzing dimensionality, reliability and validity (convergent and discriminant validity) followed by reporting on the common method bias. Finally, the structural model was assessed in order to test the relationships hypothesized by the research model. Most of the proposed hypotheses (26 out of 31) were significant except the effects of culture dominant type on relational capital (H1c) and social capital (H1d), the impact of structural capital and social capital on organizational performance (H3b and H3d), the effect of social capital on the balanced use of PMS (H5d), as well as the mediating effect of the balanced use of PMS in the relationship between social capital and organizational performance (H10d) which were not significantly supported.

CHAPTER SIX
DISCUSSION AND CONCLUSION

6.0 Overview

The central focus of this chapter is a discussion on the research's main findings derived from testing the theoretical model. In this respect, explanations of the findings are presented and the results achieved are compared with those of other similar studies identified in the literature. This is followed by the discussion about the research's contributions and managerial implications. Besides, it highlights the limitations of the research as well as providing potential avenues for further study. The fundamental objective of the research was linking Intellectual Capital (IC) and Performance Measurement System (PMS) to Organizational Performance within Iranian public listed companies. The current research adopted a quantitative perspective (questionnaire survey) in order to test more than one theory given the fact that no theory is exhaustive or comprehensive. Resource-based View (RBV) and Knowledge-based View (KBV) were considered as the main theory while the contingency approach was used as another theory that underpins the current study.

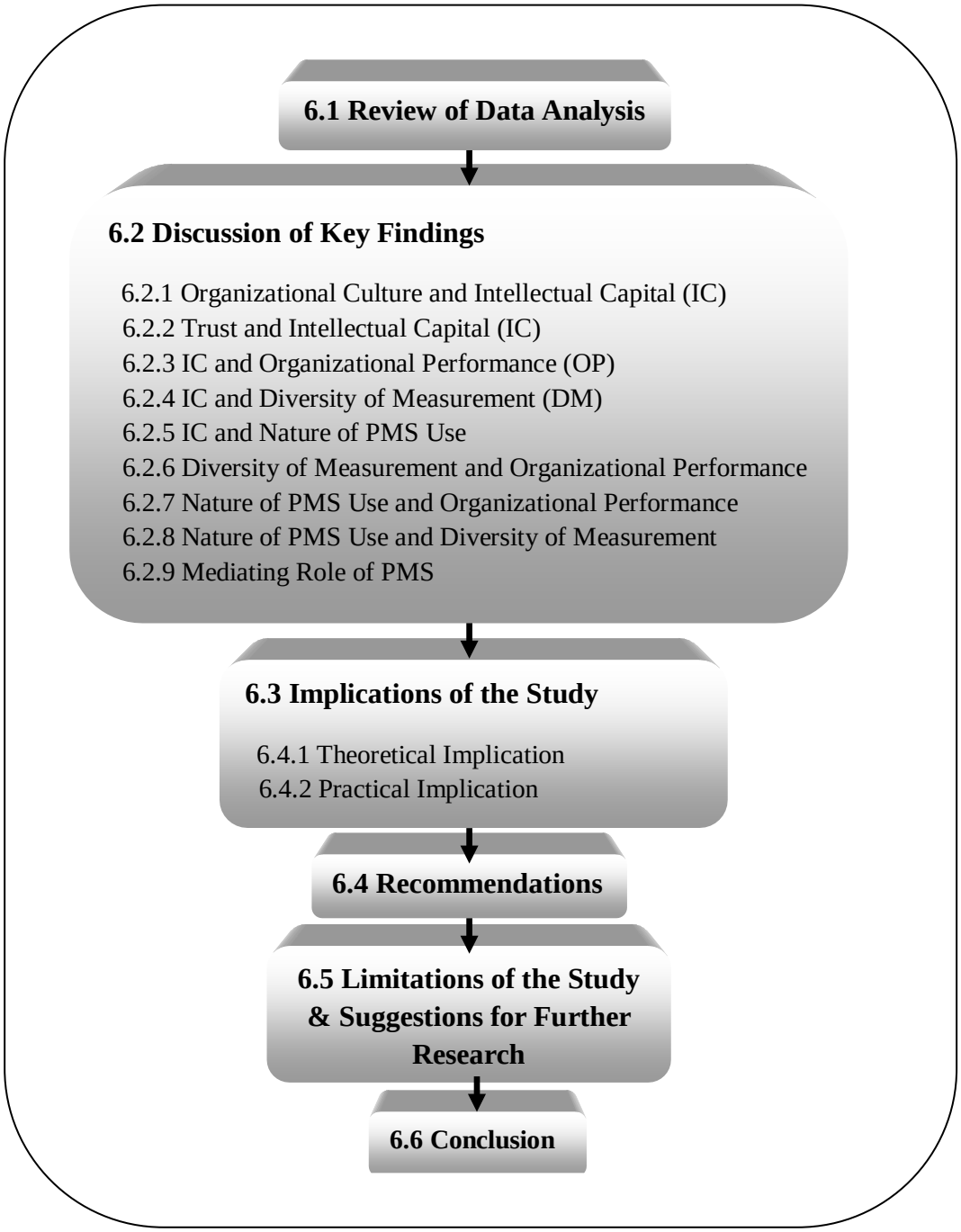


Figure 6.1
Overview of Chapter Six (Discussion and Conclusion)

6.1 Review of Data Analysis Result

As mentioned above, this research developed and empirically examined a framework for linking Intellectual Capital and Performance Measurement System to Organizational Performance in the context of a developing country, i.e. Iran. That is, the study endeavored to assess the level, nature, and shape of the Intellectual Capital as well as finding out its linkage with the certain types of Performance Measurement System usage that are likely capable of influencing their organizational performance eventually. As illustrated in Figure 6.2, the proposed theoretical model investigated the associations among two so-called antecedent variables including organizational culture and trust, four independent variables, i.e. human capital, structural capital, relational capital, and social capital, two mediating variables, namely diversity of performance measures and the balanced use of PMS, and finally organizational performance as the dependent variable.

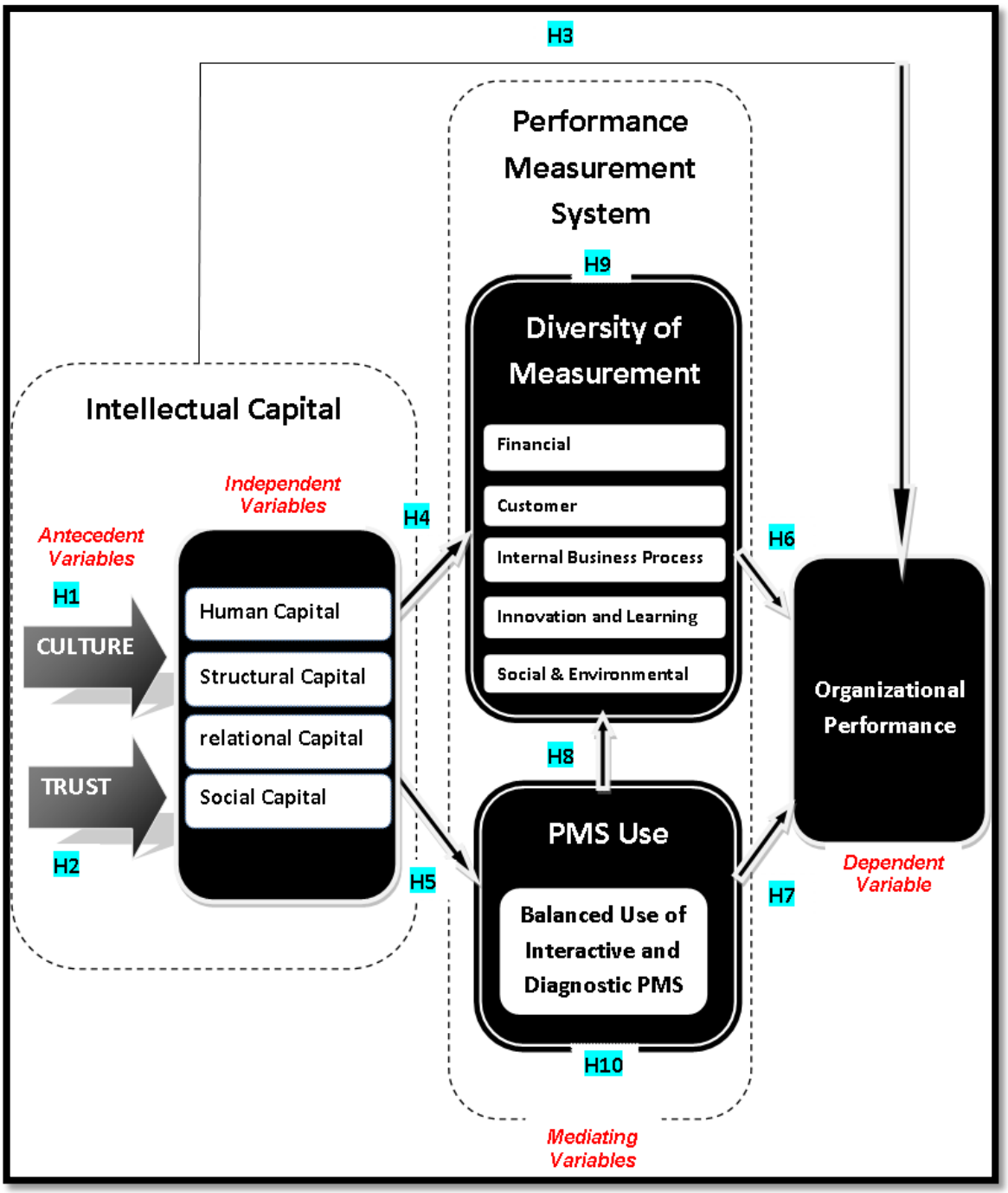


Figure 6.2
Proposed Theoretical Model

Employing SMARTPLS V2.0 M3 (Ringle et al., 2005), which using partial least squares (PLS- SEM) for the purpose of hypotheses testing on the proposed model, it was found that 25 of 31 hypothesized associations (H1a, H1b, H2a, H2b, H2c, H2d, H3a, H3c, H4a, H4b, H4c, H4d, H5a, H5b, H5c, H6, H7, H8, H9a, H9b,

H9c, H9d, H10a, H10b, and H10c) were supported, whereas six hypothesized relationships (Hypotheses 1c, 1d, 3b, 3d, and 10d) were not significantly supported.

Regarding the relationship between two antecedent variables (culture and trust) and four components of intellectual capital, the results of the data analysis showed that there was a linkage between the dominant cultural type (flexibility value) with both human capital and structural capital (H1a and H1b). Conversely, the culture was found to have no significant relationship with relational capital and social capital in the context of this study (H1c and H1d). The results also indicated that trust is significantly associated with all the four individual components of intellectual capital (H2a, H2b, H2c, and H2d).

Concerning the linkage between the four components of intellectual capital and organizational performance, the data analysis confirmed that organizational performance is significantly related to both human capital and relational capital (H3a and H3c). On the contrary, no significant relationship was found regarding the association of structural capital and social capital with organizational performance in this research (H3b and H3d).

Moreover, the results revealed that all the four independent variables, i.e. four components of intellectual capital are significantly associated with diversity of performance measures (H4a, H4b, H4c, and H4d). In a similar vein, the results also indicated that the balanced use of PMS is significantly associated with human capital, structural capital, and relational capital (H5a, H5b, and H5c) respectively. However, the analysis did not detect any evidence for the association between social capital and the balanced use of PMS in this study (H5d). Besides, findings

showed that organizational performance is significantly associated with either diversity of measurement (H6) or the balanced use of PMS (H7). Finally, the current research found that there is a significant association between the balanced use of PMS and the extent use of diversity of performance measures (H8).

Furthermore, this study hypothesized eight hypotheses regarding the mediating effect of both diversity of performance measures and the balanced use of PMS between the relationship of intellectual capital components and organizational performance. In this respect, diversity of performance measures had a mediating effect between the relationship of all four IC components (i.e. human capital, structural capital, relational capital, and social capital) and the dependent variable of organizational performance (H9a, H9b, H9c, and H9d). Along the same line, the results showed that the balanced use of PMS had a mediating effect between the relationship of three IC components (i.e. human capital, structural capital, and relational capital) and the organizational performance (H10a, H10b, and H10c). Nevertheless, hypothesis 10d, the mediating effect of the balanced use of PMS between the relationship of social capital and organizational performance, was not statistically supported due to the fact that the initial requirement of establishing a mediating effect was not fulfilled. That is, there was no significant relationship between the independent variable (social capital) and the balanced use of PMS as the mediating variable. Figure 6.3 illustrates the results of the research model.

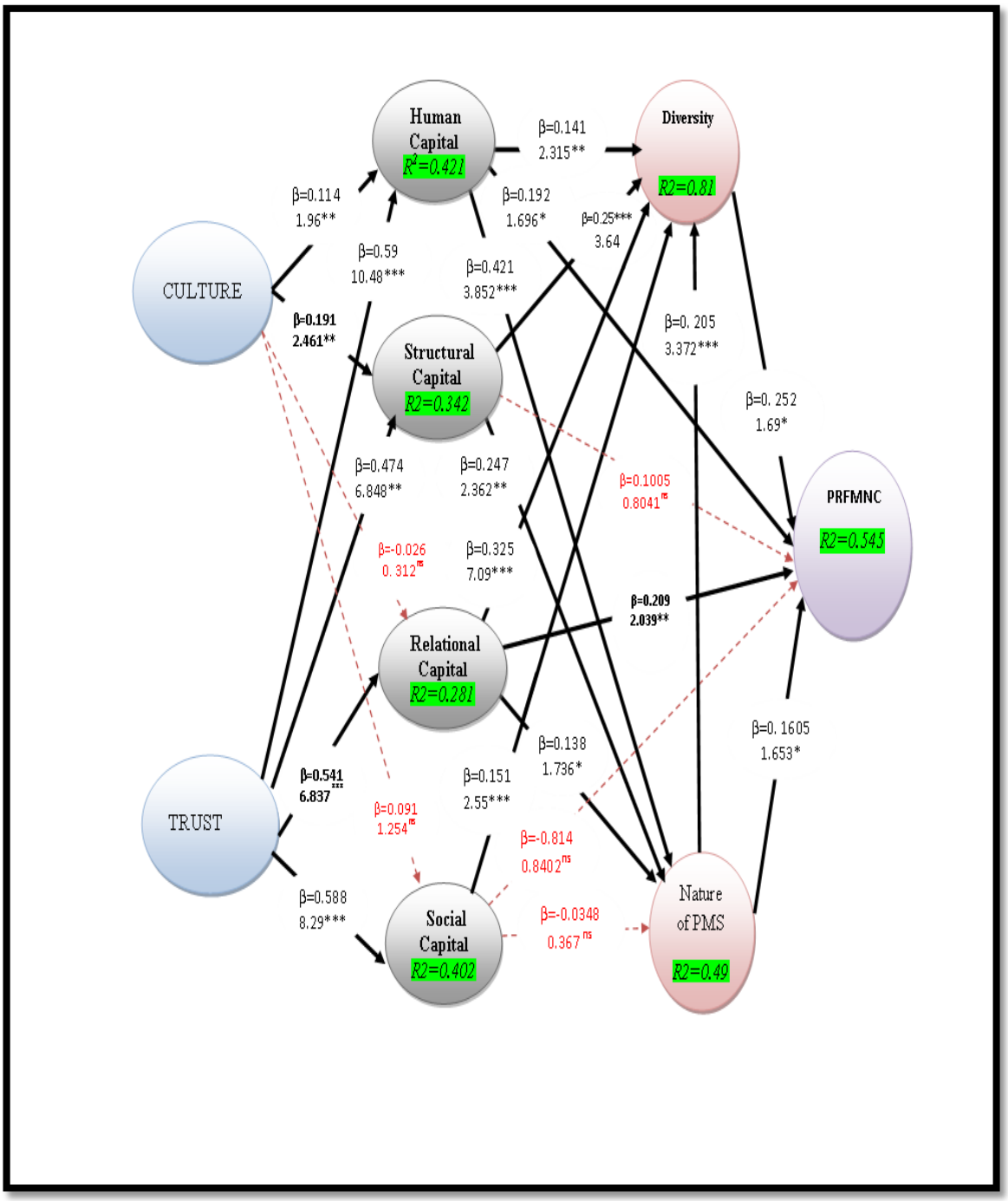


Figure 6.3
Results of the Research Model

1. The path coefficients β are shown above with their corresponding t critical value below. *p<0.1 level (n =128, t critical value =1.65); **p<0.05 level (n =128, t critical value =1.96; ***p<0.01 level (n =128, t critical value =2.58)
2. The **bold** lines indicate **significant** paths, and the **dotted** lines indicate **insignificant** paths.

6.3 Discussion of Key Findings

The following subsections will discuss all the aforesaid findings in line with the objectives of the study separately. Each subsection is followed by a table which summarizes the research finding and specifies the related hypotheses tested in terms of the way in which they affected the answers to research questions and objectives.

6.3.1 Organizational Culture and Intellectual Capital (IC)

The study detected quite robust relationship between the two components of IC (i.e. human, structural) and organizational culture, providing support for hypotheses H1a and H1b, ($p < 0.05$ level). In other words, organizations reflecting a flexibility dominant cultural type tend to have higher level of human and structural capital. Contrary to expectations, the results did not support hypotheses H1c and H1d since no statistical significance was found between organizational culture and relational capital (β=-0.026) and social capital (β=0.0915). These two insignificant findings differ from the previous studies (among others, Weston et al., (2007); Nazari et al., (2009); Alavi & Kayworth, 2005; Janz & Prasarnphanich, 2003). Such inconsistent results may be generally attributed to the different culture measurement scale i.e. competing-values approach (Krakower & Niwa, 1985; Henri, 2006b). More importantly, this inconsistency probably results from a obvious cultural differences in terms of attributes of social capital and relational capital between Iranian context and those abovementioned researches which were undertaken within a western setting (Abdallah, 2001).

The findings significantly underline this fact that culture plays a leading part in relation to IC development in terms of human capital within Iranian companies. This implies that although acquiring clever human resources and investing in

manpower learning contributes to the company, reaping the full advantage of human capital hinges upon translating the wisdom of organizational members into reusable and sustained actions. This in turn needs a culture through which employee commitment is established, learning and knowledge sharing is promoted, and employees are involved in decision making (Weston et al., 2007). As mentioned in the societal level, flexibility-oriented values promote the knowledge sharing process (as the central element of human capital) by means of cooperation and collaboration (Chow, Shields, & Wu, 1999). Generally speaking, investigation of organizational culture is necessary for comprehending knowledge flow within a firm. It is self-evident that behaviors and employee attitudes, which are the elements of corporate culture, are crucial determinant of knowledge sharing practice. For instance, employees hold certain beliefs and in the process of socialization they share their beliefs and this becomes tacit knowledge. When an individual externalizes those beliefs, tacit knowledge becomes explicit team knowledge (Nonaka and Konno, 1998). This highlights the significance of employees' knowledge perceptions and beliefs and their significance regarding value creation and value addition.

Besides, the results of the study reveal that organizational culture has a pivotal role in the development of structural capital. A company with robust structural capital requires a culture in which the organizational members would be able to seek novelties, fail, learn or attempt to discover things once more. The success would be minimal where the penalizing individuals for failures is dominating characteristic of their culture (Bontis, 1998; Sánchez-Cañizares, Munoz, & López-Guzmán, 2007). In this manner, culture could be perceived as a business philosophy which enables employees to develop ideas and foster

innovation which reinforce structural capital (Sánchez-Cañizares et al., 2007). In this respect, Bontis (1998) argued that cross-references among IC data and the cultural elements suggested by Hofstede (1980) could reveal interesting associations among constructs. As Kannan and Aulbur (2004) argued, sustained knowledge management and IC development needs the creation of a corporate memory which is flexible and adaptive for altering requirements. This is best accomplished by a robust organizational culture which lays stress on strong structural capital through requiring innovation, knowledge sharing, and encourages learning via the use of various communication channels (Kannan & Aulbur, 2004).

Broadly speaking, capability development and also the wide dissemination of capabilities and knowledge throughout the organization can be hindered by culture (Nazari et al., 2009). This, in turn, could put obstacle in the way of companies seeking to develop their own core competencies and boost their competitive advantage. It is most likely that organizations would face more challenges in situations where control values totally dominate flexibility values. This makes sense plausibly due largely to the fact that organizational culture characterized by control value engenders tight control of operations, highly structured channels of communication and restricted flows of information (Burns & Stalker, 1961). This type of culture and other similar cultural type with similar nature and features such as deference to power and bureaucratic culture and so forth could hampers the flow of knowledge and restrict knowledge sharing practices throughout the organization which in turn threaten to undermine the human knowledge resources (Chow et al., 1999). Such cultural values are also related to fear of risk (Chaminade & Johanson, 2003) in which experimentation with new idea, invention, and innovation (as the focal elements of structural capital) is not generally prevalent. It seems likely that

knowledge hoarding take place to a greater extent in companies possessing cultures with control-oriented values as opposed to flexibility values.

The aforementioned findings are in harmony with the extant literature which implies a positive relationship between flexibility-oriented dominant cultural type and knowledge related resources mainly include human and structural capital. Evidence of the positive contribution of adaptability, consistency, involvement, and mission includes Brockman and Morgan (2003) finding of the positive relationship between entrepreneurship (which incorporates adaptability) and innovation (as a major element of structural capital); Young, Sapienza, and Baumer (2003) study of the favorable influence of flexibility on knowledge transfer ability (human capital); (Huber's, 1991) argument that consistency helps an organization to interpret new information across units; and O'Reilly (1989) identification of the significant role of involvement in facilitating innovation (structural capital). The findings also lend empirical support to the theoretical observations and are consistent with previous studies in the field (David et al., 2000; Janz & Prasarnphanich, 2003; Leidner, Alavi, & Kayworth, 2008; McDermott & O'Dell, 2001; Nazari et al., 2009). The findings are consistent also with the contingency theory generally that highlights the significant role of culture in achieving some positive change within organizations. For example, as Baker (2002) argued, there is conclusive anecdotal evidence revealing that the main reason of failure in majority of famous change endeavors like TQM and reengineering, which can be classified under the structural capital of an organization, is attributed to the failure in the organizational culture change effectively. The results also corroborate the idea of Usoff et al. (2002), who asserted that the importance of the intellectual capital would vary according to particular organizational characteristics (e.g. organizational culture, size, and etc.).

6.3.2 Trust and Intellectual Capital

As depicted in the Table 6.1, Summary of Research Findings, trust as an antecedent variable was hypothesized to be positively associated with all the four components of intellectual capital (Hypothesis 2). In this regard, the results revealed that there is a strong association among trust and the four components of IC (i.e. human, structural, relational, and social capital), providing support for the hypotheses H2a, H2b, H2c, and H2d ($p < 0.01$ level). This implies that, organizations reflecting a greater extent of trust tend to have higher level of intellectual capital. These results strongly highlight the pivotal role of trust in supporting the development of the underlying components of intellectual capital within Iranian organizations. This implies that trust is determinative for promoting the process of intellectual capital development in Iranian companies. Concerning the human capital, this makes sense due to the fact that if the organization loses the trust of its personnel, they would consequently become less loyal, less motivated, and less productive (Pirson & Malhotra, 2008). In the same vein and regarding the relational capital, the company will be superseded by other competitors if customers observe a breach of trust. Besides, when there is a lack of trust regarding supplier relationships, more resources and efforts are required for contracting enforcement and monitoring which in turn bring about higher transaction costs. Companies who lose the trust of their investors are likely the quickest of all to perish (Pirson & Malhotra, 2008). All these findings are consistent with the results of previous studies (David & Fahey, 2000; Ferguson-Amores et al., 2005; Gainey & Klaas, 2003; Horwitz et al., 2003; Isaac et al., 2010; Isaac et al., 2009; Lin, 2007; McEvily, Perrone, & Zaheer, 2003; Pirson & Malhotra, 2008; Pöyhönen & Smedlund, 2004; Ståhle & Hong, 2002). For example, Nazari et al., (2009) found

that smaller trust levels among staff place obstacle in the way of effectively leveraging the intellectual capital in a wake of failure in sharing the knowledge (human and social capital), establishing relationships (relational capital), and employing systems (structural capital). Besides, several studies highlight the importance of openness of a company towards enhancing desirable knowledge management behaviors (Gold, Malhotra, & Segars, 2001), knowledge sharing and knowledge management behaviors (Alavi, Kayworth, & Leidner, 2006), and intellectual capital practices (Lynn, 1999).

In effect, companies seeking to establish trust throughout the organization would also provide the cornerstone for more effective intellectual capital development procedure overall. Once trust has been built, it facilitates the process of collecting and interpreting the needed information (McEvily et al., 2003), and it enhances the acquisition of know-how and capabilities among human capital (Thibodeaux and Faden, 1994) and contributes to establish relationships with external parties (relational capital) which entail risk-taking (Mayer et al., 1995), that are all necessary for supporting IC management systems to function effectively. As Horwitz et al. (2003) argued, building trust, among other factors, supports human resources to replace the tacit knowledge with explicit knowledge, thereby paving the way for developing intellectual capital within an organization. Concerning knowledge intensive firms, Horwitz et al. (2003) asserted that trust, together with other determinants, is instrumental in developing and converting tacit knowledge into explicit knowledge, which in turn is pivotal to development of both human and social capital which is available by others in the firm. Beside, trust is referred as a contributing factor to the learning organization (Ferguson-Amores et al., 2005), for expanding networks in order to sharing knowledge (Pöyhönen &

Smedlund, 2004), and to permit staff to be involved in decision making (Pučėtaitė & Lämsä, 2008).

Table 6.1 Summary of Research Findings **(Objective One)**

Research Question	**Research Objective**	**Hypotheses**		**Result**	**Prior Research Findings**
(1) What are the relationships between the antecedent variables (Culture and Trust) and the level of Intellectual Capital?	(1) To explore the association between the antecedent variables (Culture and Trust) and the level of Intellectual Capital	H1a	There is an association between the organizational culture and the human capital.	Supported	Weston et al (2007) Nazari et al (2009) Alavi and Kayworth, 2005; Janz and Prasarnphanich, 2003; McDermott and O'Dell, 2001; De Long and Fahey, 2000; Usoff, 2002
		H1b	There is an association between the organizational culture and the structural capital.	Supported	
		H1c	There is an association between the organizational culture and the relational capital.	**Not supported**	
		H1d	There is an association between the organizational culture and the social capital.	**Not supported**	
		H2a	There is an association between the trust and the level of human capital.	Supported	Isaac, Herremans and Kline, 2009; Lin, 2007; Ferguson-Amores et al., 2005; Poyhonen and Smedlund, 2004; Horwitz, Heng and Quazi,
		H2b	There is an association between trust and the level of structural capital.	Supported	
		H2c	There is an association between the trust and the level of relational capital.	Supported	

Table 6.1 Summary of Research Findings **(Objective One)** (Continued)

Research Question	Research Objective	Hypotheses		Result	Prior Research Findings
		H2d	There is an association between the trust and the level of social capital.	Supported	2003; McEvily, Perrone and Zaheer, 2003; Gainey and Klaas, 2003; Stahle and Hong , 2002

6.3.3 Intellectual Capital and Organizational Performance

The third set of hypotheses examined whether the components of intellectual capital are positively associated with organizational performance (see Table 6.2). In this respect, the significance of the path coefficients of two IC components (i.e. human capital & relational capital) and organizational performance provide support for hypothesis 3a ($p < 0.1$ level) and 3c ($p < 0.05$ level). Hence, these results confirmed that the investment in human capital and relational capital can potentially bring about organizational performance improvement in Iranian companies. The findings are consistent with the existing literature regarding the role played by human capital in augmenting organizational performance. Conversely, no significant relationship was found regarding the association of structural capital and social capital with organizational performance in this research (H3b and H3d). There has been lesser extent of inconsistency in researches regarding the influence of human capital and relational capital on organizational performance in comparison with observations on structural capital and social capital (Bontis et al., 2000; Chen et al., 2005; Firer & Williams, 2003; Wyatt, 2005, 2008). Many of the prior leading studies consider human capital as the central dimension of intellectual capital. For instance, among others, Edvinsson and Malone (1997) as well as Bontis

(2004) asserted that human capital play pivotal role in driving organizations towards wealth.

These findings are also consistent with some recent observations. For example, Nazari et al. (2009) carried out a comparative study concerning the intellectual capital development level in Canada and Middle East. They observed that structural capital was not significantly different between companies in Canada and Middle East. Along the same line as this research, they showed that it is the investment in the human capital which will make a difference between the extents of intellectual capital management that could consequently bring greater wealth for company. In the same vein, Clarke, Seng, and Whiting (2011) found that human capital is a particularly important element of IC within Australian public listed companies in contrast with structural capital. Further, As Isaac et al. (2010) argued, human capital could cause intellectual capital creation and development. The findings of their research showed that deploying and highlighting human capital procedures will result in an improvement in efficiency of IC management procedures. Accordingly, the findings of this research concerning the linkage of human capital and organizational performance is in harmony with the previous theoretical and empirical works which place human capital at the heart of intellectual capital management and measurement. Similar to the human capital, the results of data analysis provided support for the association between relational capital construct and organizational performance construct, thereby lending weight to prior studies(Bontis, 1998; do Rosário Cabrita & Vaz, 2005; Wang & Chang, 2005). This implies that Iranian organizations make every endeavor to build, maintain, and constantly develop relationships with external stakeholders as one

key resource which potentially is able to augment their prospective organizational performance.

As mentioned above, the results of this study did not lend support for the significant association between structural capital and organizational performance (H3b). This means that internal organizational systems or so-called structural capital deployed to acquire, accumulate and diffuse organizational information and knowledge do not seem to influence firm performance directly within Iranian public listed organizations. The prior studies indicate mixed findings in relation to the significant relationship between structural capital and performance. The finding of this research is not consistent with some of the previous researches that show evidence for this significant association (Bontis, 1998; Bontis et al., 2000; de Pablos, 2002; do Rosário Cabrita & Vaz, 2005). For instance, Bontis et al. (2000) found a positive linkage between structural capital and performance in Malaysian context. In another observation in Taiwan, Chen et al. (2005) found a significant association between structural capital and performance. However, there have been some other studies showing a lack of significant correlation between structural capital and performance (Firer & Williams, 2003; Wyatt, 2005, 2008; Nazari et al., 2009).

Likewise, the results of the analysis did not provide support for the significant relationship between social capital and organizational performance (H3d) same as structural capital. This implies that social capital which carrying the elements of intra-firm social networks such as associability and shared vision (Tsai & Ghoshal, 1998) do not appear to impact firm performance within Iranian public listed organizations. Accordingly, the fundamental tenet of the social capital theory which assumes that network of relationships embedded within networks of mutual

acquaintance and recognition create a precious resource for the conduct of social affairs (Nahapiet & Goshal, 1998) is not supported in the context of this study. Prior studies indicate mixed findings in relation to the significant relationship between social capital and performance. The finding of this research is not consistent with some of the previous researches that show evidence for this significant association (Ellinger et al., 2012; Leana & Van Buren, 1999; Prusak & Cohen, 2001; Stam, Arzlanian, & Elfring, 2013; Steinfield, Scupola, & López-Nicolás, 2010; Tsai & Ghoshal, 1998; Youndt & Snell, 2004). Yet, there have been some other research indicating a lack of significant relationship between social capital and performance. For example, Yusoff et al. (2004) indicated that social capital per se is not associated with performance; instead its impact on performance becomes significant when interacted with other dimensions of IC.

Table 6.2 Summary of Research Findings **(Objective two)**

Research Question	**Research Objective**	**Hypotheses**		**Result**	**Prior Research Findings**
(2) Is there an association between the level of Intellectual Capital and organizational performance?	(2) To investigate the association between the level of Intellectual Capital and organizational performance.	H3a	The higher the level of human capital, the higher is the organizational performance levels.	Supported	Edvinsson & Malone (1997); Bontis (2004); Nazari et al. (2009); Clarke et al., (2011); Isaac et al., (2010)
		H3b	The higher the level of structural capital, the higher is the organizational performance levels.	**Not supported**	Nazari et al. (2009); Clarke et al., (2011); Firer & Williams, 2003; Wyatt, 2008; Nazari, 2010

Table 6.2 Summary of Research Findings **(Objective two)** (Continued)

Research Question	Research Objective	Hypotheses		Result	Prior Research Findings
		H3c	The higher the level of relational capital, the higher is the organizational performance levels.	Supported	Bontis, 1998; Wang and Chang, 2005; Do Rosario Cabrita and Landeira Vaz, 2006
		H3d	The higher the level of social capital, the higher is the organizational performance levels.	**Not supported**	Yusoff et al. (2003)

Overall, only two hypotheses out of four were supported regarding the third set of hypotheses that signify the direct effect of intellectual capital components on organizational performance. This may imply that the benefit organizations realize from intangible resources is indirect and mediated by its performance measurement system which will examine in the next two sets of hypotheses.

6.3.4 Intellectual Capital and Diversity of Measurement

This research observed strong association among the four components of IC (i.e. human, structural, relational, and social) and the extent use of diversity of performance measures, providing support for hypotheses H4a ($p < 0.05$ level), H4b ($p < 0.01$ level), H4c ($p < 0.01$ level), and H4d ($p < 0.01$ level). In other words, organizations reflecting a higher level of intellectual capital tend to use diversity of performance measures (including a broad set of multiple measures) to a greater extent. It is self-evident that such diverse performance measures concentrate on intangible resources such as key customers, internal processes, and learning and growth (Simons, 2000). These results indicate that, across firms, managers employ more multiple performance measures in parallel with the level of their intangible

resources and capabilities. In other words, high IC companies tend to emphasize a broader set of financial and non-financial measures. The rationale behind this is that high IC organizations reasonably possess a greater level of intangible resources or assets. Since such resources are not easy to measure for financial appraisal (Leadbeater, 2001; Roslender & Fincham, 2001, Powell, 2003), the knowledge-intensive organizations ought to utilize a broader set of financial and non-financial indicators for the purpose of gaining the unobservable value of the resources' (intangible resources) costs, advantages, and contribution. The results are consistent with Usoff et al. (2002) as well as Tayles et al. (2007) who propose that knowledge-intensive companies which possess more intellectual capital ought to employ a broader set of non-financial performance indicator for capturing the contribution arising from intellectual capital. In a similar vein, Widener (2006) observed that executives lay greater stress on multiple performance measures within organizations those place importance on strategic intangible resources including human capital and structural capital. Consequently, this implies that companies with a greater level of IC tend to use both financial and nonfinancial measures in comparison with low IC companies. This corroborates the notion of Otley (2002) who argues that financial measures must not be disregarded, nor privileged.

Scorecard measures are considered as a comprehensive set of measures which consist of either financial or nonfinancial performance measures through which contributions and values of intellectual capital can be captured. Celemi's Intangible Assets monitor, Skandia Navigator, and the Balanced Scorecard (BSC) are the examples of Scorecard measures which are not limited to only financial measures (Norreklit, 2000). Hence, they are perceived as techniques that change the manner of communicating in relation to strategies. According to Lipe and Salterio (2002), scorecard techniques are frameworks to develop a range of multiple indicators for

critical activities drivers. They encompass four individual perspectives, namely financial measures, customer measures, internal business process measures, and finally learning and growth measures (Kaplan & Norton, 1992; Hoque & James, 2000; Henri, 2006b). BSC is the most distinguished in comparison with other scorecard measurement styles since consultants have promoted it more vigorously. Accordingly, it is plausible to argue that knowledge-intensive companies seem to have a propensity for utilizing a combination of diverse financial and non-financial performance measures. This is in harmony with the idea of Usoff et al. (2002) who propose that high IC organizations tend to employ non-financial indicators for the purpose of capturing IC's contribution. With the above discussion in mind, it can be argued that knowledge organizations (high IC companies) are more likely to lay emphasis on both financial and nonfinancial measures in comparison with low IC companies. The finding is in agreement with Otley's (2002) finding which proposes that financial angle of PMS must not be dismissed, nor privileged.

6.3.5 Intellectual Capital and Balanced Use of PMS

As can be seen in Table 6.3, the fifth set of hypotheses investigated whether the level of intellectual capital is positively associated with the extent use of the balanced use of PMS within Iranian companies. The joint use of PMS is generated by the balanced use of PMS in a diagnostic and interactive manner (Henri, 2006b). Such desirable integration reflects competition (positive against negative feedback) and complementarity (concentrate on intended and emergent strategies). In this respect, the significance of the path coefficients of three IC components (i.e. human capital, structural capital, and relational capital,) and that balanced use of PMS provide support for the hypothesis 5a ($p < 0.01$ level), 5b ($p < 0.05$ level) and 5c ($p < 0.1$ level). However, no significant relationship was found concerning the

association between social capital and the balanced use of PMS in the context of this study (H5d). This result presents an unexpected finding, which could be attributed to the different characteristic of organizations' social capital (i.e. differences in the nature of informal interactions and communication among organizational members within an organization) in Iranian context compared with those western studies (e.g. Widener, 2006; Usoff et al., 2002). The other plausible explanation is that social capital per se and without the others main components of IC may not be effective enough to make a major breakthrough within companies (Yusoff et al., 2003). In this respect, some recent IC scholars (e.g. Herremans et al., 2010; Nazari et al., 2009; Huang et al., 2010) do not even separate the components of IC and use an aggregate IC concept owing to the strong intercorrelation among the IC components. Future research might seek to clarify the basis of the inconsistent result through considering the aggregated score of IC to affect the PMS use and performance as well.

These findings overall imply that, Iranian organizations reflecting a greater extent of intellectual capital tend to apply more balanced use of PMS in a diagnostic and interactive fashion. The result is consistent with the extant literature regarding the positive role of such balanced use of PMS for capturing the real values and contributions of knowledge-related resources and capabilities in today's knowledge-based economy (Amason, 1996; De Dreu, 1997; English, 2001; Henri, 2006a; Nicotera, 1995; Tjosvold, 1997; Van Slyke, 1999). For example, Henry (2006a) suggested that the joint use of PMS in a diagnostic and interactive fashion is able to foster the intellectual capabilities such as organizational learning, innovativeness, and market orientation. In effect, there is a natural fit among the requirements of such intellectual resources and that organic use of control systems

(Chenhall & Morris, 1995; Van de Ven, 1986). According to Dent (1987), the joint use of diagnostic and interactive PMS simultaneously is able to encourage organizational dialogue and promote learning. It offers the chance towards dialectically styled interactions through providing an avenue to dispute lively and dynamically opposing positions (Chenhall, 2004). More specifically, balanced use of PMS offers precious information which in turn leads to innovation, flexibility, and improvement. Besides, it is capable of promoting constant communication in relation to strategic issues and boosting reciprocal comprehension. It could also stimulate open and vigorous arguments as well as supporting employees towards grouping their notions and actions (De Dreu, 1997; Tjosvold, 1997; Amason, 1996). Accordingly, it is plausible to conclude that such innovative control system style is appeared to be the more appropriate choice in today's knowledge-based economy with the growing importance of intangible assets. That is, knowledge-intensive organizations with more intangible resources and capabilities tend to employ more such organic control mechanism i.e. the balanced use of PMS in order to take full advantage of their own strategic resources. As Usoff et al. (2002) noted, companies should expand processes through which they would be able to capture IC's advantages. In that regard, Usoff and colleagues suggested that firms may change their conventional PMS for gaining and ensuring long-term success.

Table 6.3 Summary of Research Findings **(Objective three)**

Research Question	**Research Objective**	**Hypotheses**		**Result**	**Prior Research Findings**
(3) Is there an association between the Intellectual Capital and the extent use of PMS (either in terms of	(3) To determine the association between the Intellectual Capital and the extent use of PMS (either	H4a	The higher the level of human capital, the higher is the diversity of measurement.	Supported	Usoff et al. (2002);
		H4b	The higher the level of structural capital, the higher is the diversity of measurement.	Supported	Tayles et al (2007); Widener

Table 6.3 Summary of Research Findings **(Objective three)** (Continued)

Research Question	Research Objective	Hypotheses		Result	Prior Research Findings
diversity of measurement or balanced use of PMS in a diagnostic and interactive fashion) within organizations?	in terms of diversity of measurement or balanced use of PMS in a diagnostic and interactive fashion) within organizations.	H4c	The higher the level of relational capital, the higher is the diversity of measurement.	Supported	Henri, 2006b; English, 2001; VanSlyke, 1999; Amason, 1996; Nicotera, 1995; Morris, 1995; DeDreu, 1991; Tjosvold, 1991; Van de Ven, 1986
		H4d	The higher the level of social capital, the higher is the diversity of measurement.	Supported	
		H5a	There is an association between the level of human capital and the balanced use of PMS in a diagnostic and interactive fashion.	Supported	
		H5b	There is an association between the level of structural capital and the balanced use of PMS in a diagnostic and interactive fashion.	Supported	
		H5c	There is an association between the level of relational capital and the balanced use of PMS in a diagnostic and interactive fashion.	Supported	
		H5d	There is an association between the level of social capital and the balanced use of PMS in a diagnostic and interactive fashion.	**Not supported**	

6.3.6 Diversity of Measurement and Organizational Performance

The results of statistical analysis confirmed the hypothesized association between the extent use of diversity of performance measures and organizational performance, thereby providing support for the hypothesis H6 ($p < 0.1$ level). This means that, organizations reflecting a higher extent usage of multiple performance measures tend to be superior in terms of organizational performance. This result is in line with many of the prior seminal studies in the performance measurement

literature (e.g. Lingle & Schiemann, 1996; Scott & Tiesen, 1999; Hoque & James, 2000; Banker et al., 2000; Davila, 2000; Baines & Lang-field-Smith, 2003; Said et al., 2003; Hoque, 2004; Davis & Albright 2004).

According to Ittner et al. (2003), the more straightforward way to establish an innovative performance measurement is the utilization of more diversity of measures in a broad range of non-financial and financial indicators. Proponents of this perspective contend that it will likely engender superior organizational performance. For example, Stede et al. (2006) observed that the increase of performance measurement diversity bring about performance benefits, specifically by expanding the use of objective and subjective nonfinancial measures which is the case in this research. In the same vein, Jusoh et al. (2008) found that BSC measures adoption is significantly associated with firm performance in Malaysia, asserting that the more extent of BSC adoption bring about the greater firm performance.

6.3.7 The Balanced Use of PMS and Organizational Performance

As summarized in Table 6.4, the seventh hypothesis investigated whether the balanced use of PMS (the balanced use of diagnostic and interactive PMS) is positively associated with the organizational performance within Iranian companies. As mentioned earlier, the balanced or joint use of PMS in a diagnostic and interactive manner (Henri, 2006a) reflects competition (positive against negative feedback) and complementarity (concentrate on intended and emergent strategies). In this regard, the significance of the path coefficients between the balanced use of PMS and organizational performance provide support for hypothesis 7 ($p < 0.1$ level). This indicates that, those Iranian organizations which

employ the balanced use of diagnostic and interactive PMS to a greater extent tend to be superior in terms of organizational performance. This result is consistent with the conflict literature which suggested that tension is not inevitably adverse in essence but alternatively might be favorable to entities (De Dreu, 1997; Nicotera, 1995). Despite some underlying notions which assume that conflict and tension is adverse and destructive, ample evidence within the conflict literature asserts that they are likely advantageous to either individual or corporate performance. This literature suggests that refusing and repressing conflict attenuates creativity, decision quality, product development, and communication (De Dreu, 1997; Nicotera, 1995). In effect, the balanced use of PMS promotes organizational dialogue, motivate creativity, and focus organizational attention (De Dreu, 1997; Tjosvold, 1997; Amason, 1996; Van Slyke, 1999; English, 2001). These three aforesaid factors are augmented by the integration of diagnostic and interactive use. Henri (2006a) observed a robust association between the balanced use of PMS and performance of Canadian manufacturing firms. He asserted that the capability of establishing and keeping a balance between two opposite uses of PMS which concurrently attempt to foster innovation while looking for predictable achievements might per se brings a capability that is valuable, distinctive, and imperfectly imitable which in turn could bring about a raise in organizational performance.

Table 6.4 Summary of Research Findings **(Objective Four)**

Research Questions	Research Objectives	Hypotheses		Results	Prior Research Findings
(4) Is there an association between the extent use of PMS (either in terms of measurement diversity or balanced use of PMS) and organizational performance?	(4) To examine the association between the extent use of PMS (either in terms of measurement diversity or balanced use of PMS) and organizational performance.	H6	The higher the diversity of measurement, the higher is the organizational performance.	Supported	Hoque and James, 2000; Hoque, 2004; Davis and Albright 2004; Van der Stede et al 2006; Jusoh et.al, 2008
		H7	There is an association between the balanced use of PMS and organizational performance.	Supported	Henri, 2006; DeDreu, 1991; Tjosvold, 1991; Amason, 1996; VanSlyke, 1999; English, 2001; Widener, 2006b

6.3.8 Balanced Use of PMS and Diversity of measurement

The evidence of the study brings strong support to hypothesis 8 by indicating that the joint use of PMS in a diagnostic and interactive manner are significantly associated to a greater extent of diversity of measurement (0.205; $p < 0.01$). This shows that Iranian companies which place emphasis on the balanced use of PMS in a diagnostic and interactive manner tend to employ diversity of performance measures to a greater extent. Logically, this makes sense since a combination of diagnostic and interactive PMS use contains the features of either mechanistic controls or organic controls represent monitoring use and attention focusing respectively (Henri, 2006b) which in turn imply more measurement diversity. So, it is obvious that organizations which employ such innovative and broad control system need to use more diversity of measures. This result is consistent with the

management control system literature which suggested that there should be a natural fit between the requirements of the use of more multiple performance measures and a combination of mechanistic and organic use of control system (Henri, 2006b).

Table 6.5 Summary of Research Findings **(Objective Five)**

Research Questions	Research Objectives	Hypotheses		Results	Prior Research Support
(5) Is there an association between the extent of the balanced use of PMS and the extent use of measurement diversity?	(5) To investigate the association between the extent of the balanced use of PMS and the extent use of measurement diversity.	H8	There is an association between the extent of the balanced use of PMS and the extent use of measurement diversity.	Supported	Henri, 2006b

6.3.9 Mediating Role of Performance Measurement System

The last two set of hypotheses, namely H9 and H10 investigated whether the two aspects of PMS in this research i.e. diversity of measurement and the balanced use of PMS mediate the relationship between the four intellectual capital components and organizational performance. In this respect, the results bring support for all the hypothesized mediating effect except hypothesis H10d (the mediating effect of the balanced use of PMS between social capital and organizational performance). The reason for such insignificant result (H10d) is that the initial conditions for establishing the mediation effect were not fulfilled. That is, there was no significant association between the independent variable (social capital) and mediating variable (the balanced use of PMS) as well as between independent variable (social capital) and dependent variable (organizational performance). The justification for the forgoing insignificant relationships (social

capital → organizational performance as well as social capital → balanced use of PMS was already provided in that related section.

As mentioned at the outset of this section, the results of this research confirmed the hypotheses (H9a), (H9b), (H9c), and (H9d) that state diversity of measurement mediates the relationship between all four IC components (i.e. human capital, structural capital, relational capital, and social capital respectively) and organizational performance. Along the same line, the analysis showed that the balanced use of PMS mediates the relationship between three components of IC (i.e. human capital, structural capital, and relational capital) and organizational performance, thereby providing support for hypotheses (H10a), (H10b), and (H10c) respectively. In gist, H9 and H10 (the mediating effect of PMS) are hypothesized based on the premise that organizations evaluate their potential in terms of fundamental critical resources/capabilities and then deploy appropriate PMS (in order to manage those resources more effectively) that are aligned with those resources which in turn bring about performance improvement.

The result of analysis regarding the mediating role of PMS overall implies that some of the advantages stem from the organization's intellectual capital and strategic resources would influence business performance indirectly through the emphasis put on the usage of PMS. The rationale behind this is that once organizations acquire their strategic resources and capabilities, performance measurement system would be employed in order to assist in the capturing and managing such vital resources. Then, by providing useful feedback and information on that fundamental capital, which aimed at supporting companies in exploiting the

strategic resource effectively, in turn leads to performance improvement (Widener, 2006).

The findings are consistent with the Resource-based View which assumes that organizations are not able to realize their benefits if their strategic intangible resources are not managed appropriately. According to Simons (2000), the performance measurement system is perceived as a powerful lever to support management of strategic resources. As Kaplan and Norton (1996) claimed, appropriate management and measurement of the underlying critical success factors (e.g. intellectual capital) could influence business performance positively. In this regard, managers ought to adopt indicators that offer relevant information concerning the company's underlying strategic resources and critical success factors (Kaplan & Norton, 1996; Simons, 2000). The result of the current research is also in harmony with the ideas of some seminal earlier works in the PMS literature. The admired maxim "if you can't measure it, you can't manage it" (Kaplan & Norton, 1996, p. 21) assumes that organizational performance would be significantly affected through the measurement of the organization's underlying critical success factors (e.g., capabilities and resources). Besides, there is other empirical evidence which lends support to the presence of such indirect association. (e.g. Gul, 1991; Mia, 1993; Gul & Chia, 1994; Chong & Chong, 1997; Mia & Clarke, 1999; Baines & Langfield-Smith, 2003; Widener, 2006, Jusoh, 2008; Joiner et al., 2009). Broadly speaking, the findings regarding the mediating role of PMS in the relationship of IC and performance corroborate this notion that intangible resources like knowledge and technology seldom are able to affect directly and immediately on corporate effectiveness, instead they often impact organizational

performance through chains of cause-and effect associations including two or three intermediate stages (Huselid, 1995; Kaplan & Norton, 2001).

Table 6.6 Summary of Research Findings **(Objective Six)**

Research Questions	Research Objectives	Hypotheses		Results	Prior Research Findings
(6) Do the 'diversity of measurement' and 'balanced use of PMS' mediate the relationship between IC and organizational performance?	(6) To determine whether 'diversity of measurement' and 'balanced use of PMS' mediate the relationship between IC and organizational performance.	H9a	Diversity of measurement mediates the relationship between human capital and organizational performance	Supported	Gul, 1991;Mia, 1993; Gul and Chia, 1994; Kaplan and Norton, 1996; Chong and Chong, 1997; Mia and Clarke, 1999; Simon, 2000; Lev, 2001; Baines and Langfield-Smith, 2003; Widener, 2006; Jusoh, 2008; Joiner et al., 2009
		H9b	Diversity of measurement mediates the relationship between structural capital and organizational performance	Supported	
		H9c	Diversity of measurement mediates the relationship between relational capital and organizational performance	Supported	
		H9d	Diversity of measurement mediates the relationship between social capital and organizational performance	Supported	
		H10a	The balanced use of PMS' mediates the relationship between human capital and organizational performance	Supported	
		H10b	The balanced use of PMS' mediates the relationship between structural capital and organizational performance	Supported	
		H10c	The balanced use of PMS' mediates the relationship between relational capital and organizational performance	Supported	
		H10d	The balanced use of PMS' mediates the relationship between social capital and organizational performance	**Not supported**	

6.4 Implications of the Study

Pursuing the main objectives of the study, this research carries several momentous implications which derived from the findings. In this respect, the following two subsections specifically present the implications of the current study, either in terms of theoretical or practical perspective. The details of the discussion are presented below.

6.4.1 Theoretical Implications

Encountering the growing significance of knowledge-based assets to augment a sustainable competitive advantage (Menor et al., 2007; Nonaka, 1991), companies ought to identify the way towards appropriate conceptualization and utilization of such invaluable assets. Intellectual capital can be appeared in different forms such as personnel skill and know-how, institutionalized data and routines, social networks within organization, and relationships with external clients and parties such as customer, suppliers, government and so forth. The concept of 'intellectual capital' generally embodies all the knowledge-related assets which are perceived as a cornerstone of organizational wealth and competitive advantage. In spite of the increasing perception regarding the significance of IC, companies encounter some complexities in relation to recognizing, managing, and capturing real value arising from IC mainly because of its tacit nature (Berry, 2004; Brooking, 1997). Furthermore, as Marr (2012) asserted, there is a lack of consensus about which components, overall, frame IC across various academic disciplines. Dealing with these issues, this study theoretically develops and empirically investigates a variety of different factors of IC which covers four main components i.e. human capital, structural capital, relational capital, and social capital in addition to two antecedents dimensions, namely trust and culture within the IC framework.

With the foregoing discussion in mind, first and foremost, this study combines literature on IC across diverse academic fields. The complex conceptualization of IC with four subdimensions as well as supplementing two antecedent constructs (trust and organizational culture) offer a more systematic manner to combine several knowledge-based drivers towards performance which have not been addressed simultaneously in a comprehensive framework. According to the model, it seems that majority of the earlier studies have mainly emphasized merely some particular dimensions of IC like structural capital and human capital. In contrast, components such as relational capital and social capital have overlooked in the literature (Jansen, Van Den Bosch, & Volberda, 2006). Responding to this issue, this study offers a more comprehensive set of empirical evidence to shed light on the role of IC in increasing desirable organizational outcomes through synthesizing the multiple aspects of IC in one research model.

Second, as mentioned above, this study contributes also by empirically investigate trust and organizational culture as the two important determinants of intellectual capital as proposed by Bontis (1999). In other words, regarding theoretical perspective, this study extends prior intellectual capital literature employing a contingency view by exploring the effect of organizational culture and trust on the intellectual capital development. Therefore, the other main contribution of this research lies in its being among the very early research on exploring the linkage between context (contingency factors) and intellectual capital development. In line with the organizational effectiveness literature as well as contingency theory, the findings of the study highlight the importance of organizational culture

and trust in motivating and maximizing the value of its intellectual assets (Yu & Yanfei, 2008).

Third, concerning PMS literature, the body of research to date has tended to focused mainly on issues related to the diversity of measurement or the integrated financial and non-financial measures as a single-attribute of PMS (Bourne et al., 2000; Ittner et al., 2003b; Widener, 2006). This line of research has studied several contingent factors which determine the diversity of measurement. Nevertheless, the investigation of a multiple-feature of PMS (PMS as a whole) has been overlooked in the management accounting literature. That is, far too little attention has been paid to considering two fundamental components of PMS (i.e. the balanced use of PMS and the diversity of measurement) simultaneously. Besides, many questions remain unanswered concerning the link between these two components (a notable exception is Ittner et al., 2003b and Henri, 2006b). To sum up, from a theoretical angle, this research underscores the importance of diversity of measurement and the nature of use as two complementary components of PMS which should be investigated particularly. Furthermore, the study examined Balanced PMS use as one contingent factor which affect and determine the extent use of diversity of measurement. In this regard, the findings confirmed that the diversity of measurement would vary in parallel with the extent use of the balanced PMS use.

Fourth, this research contributes to the extant body of research at the boundary between intellectual capital and performance. It synthesizes a robust framework from the contingency lens, the resource-based view, to a management accounting setting. This theoretical model offers fascinating insights about the dual roles of intellectual capital either in making a major breakthrough in the evolution of management accounting system and practices or predicting organizational

outcomes. During the last decade, the attention has devoted to the resource-based view as one of the basic theories for justifying the source of competitive advantage and the performance differences among firms during a long period. Prior studies have presented somehow ambiguous and mix findings concerning the association between IC and performance. Although many studies focusing on performance and valuation have proved a positive impact of intellectual capital on corporate performance (for example Bontis et al., 2000; Choi et al., 2000; Wang & Chang 2005; Youndt & Snell 2004), some supports a negative relationship as well (Fernandes et al., 2005; Huang & Liu, 2005; Chen et al. 2005; Firer & Williams, 2003). First, these findings may suggest that more intellectual capital is not always appropriate and is contingent upon the context and so, the level of intellectual capital within organizations may differ significantly. This drives us to the contingency theory. Second, it has been discussed that these mixed findings are somewhat associated with this notion that intellectual resources like knowledge and technology seldom are able to influence performance directly and immediately, instead they often affect these organizational outcomes through chains of cause-and effect relationships involving two or three intermediate stages (Huselid, 1995; Kaplan & Norton, 2001). This is the case in the framework of the current study in which intellectual capital affect organizational performance indirectly through the mediating role of performance measurement system (this is highly consistent with fit as the mediation concept under the contingency theory).

Fifth, as Petty and Guthrie (2000) argued, intellectual capital is rather novel are to research and work in this area is still in preliminary stage. Although IC is a challenging subject to research, it is an important stream of research due to its capability to add value to a new knowledge. As elaborated previously, broadly

speaking, there are few earlier studies regarding the IC-related topic given the fact that research in this topic is still at a preliminary stage. More importantly, very scant attention has devoted to the intellectual capital in relation to management accounting and control system (e.g. Mouritsen et al., 2001; Tayles et al., 2002; Usoff et al., 2002; Widener, 2006; Tayles et al., 2007). In fact, scarce studies relatively have been reported on management accounting for intellectual capital. Specifically, none of the previous empirical studies, according to my literature review, have examined specifically the mediating effect of multiple features PMS in the relationship between IC and organizational performance. Hence, the other major contribution of this research lies in its being among the early work on linking intellectual capital to management accounting and control system. In that respect, this research extends the management accounting literature in particular and accounting in general.

Sixth, this study offers further insights into whether the emphasis put on the use of PMS, from two individual but complementary aspects, “matters” to the organization through examining the relationship with performance. Evidence is mixed regarding the significant relationship between PMS and firm performance (Widener, 2006; Wouters, Kokke, Theeuwes, & Van Donselaar, 1999). It has been argued that these ambiguous results are generally attributed to the considerable variability in the nature and the extent use of PMS. According to the literature, one of the major impediments to organizations’ success is attributed to their inability to develop a systematic and robust PMS (Usoff et al., 2002). Accordingly, addressing performance measurement system from two separate but complementary aspects simultaneously provides a more systematic performance measurement system which in turn could determine the organizational outcome positively. Moreover, the four

subdimensions of the construct of Diversity of Performance Measures (which largely borrowed from Kaplan and Norton's BSC) supplemented by new performance measures items classified under the heading of social and environmental perspective (Hoque & Adams, 2008). With regard to inconsistencies of PMS literature findings, it can be argued that the ambiguous results may also stem from the restricted attention devoted to the balanced use of MCS created by multiple uses or simultaneous utilization of interactive and diagnostic MCS (Henri, 2006b). Accordingly, taking such MCS integration (arising from the balanced use of diagnostic and interactive use) into consideration provide a profound insight into the difficulties around the use of MCS for the main purpose of fostering innovation while allowing accomplishment of foreseeable goals (Henri, 2006b). With this argument, the more research regarding the association between PMS, as one of the major elements of MACS, is certainly warranted.

Seventh, the findings of the study are significant if the context of the current research is also taken into consideration. According to the literature, most of the existing studies on IC have mainly concentrated on the developed nations especially within western context. As by Sharabati and Bontis (2008) asserted, there is a lack of empirical work within developing nations. There is scarcely any literature available on studies done on intellectual capital in the context of Iran (Mehralian et al., 2012 Namvar et al., 2010; Nazari et al., 2009). Accordingly, this study contributes to the growing body of knowledge by providing empirical evidence on intellectual capital and knowledge-related resources and also its linkage with management accounting and organizational performance in the context of Iran. Besides, such experiment in Iran could be helpful for other developing nations with

comparable political, economic, and cultural contexts like Middle Eastern countries.

6.4.2 Practical Implications

Addressing two antecedent variables (i.e. culture and trust) as well as the four key IC components, namely human, structural, social, and relational capital in one research model contributes to practice from different aspects. Firstly, the provision of various sub-elements of intellectual capital support executives to detect, capture, and assess the different kinds of knowledge resources which must be taken into consideration one by one for maximizing organizational performance. Now, the comprehension of the vast majority of executives with regard to intellectual capital remains insufficient, inasmuch as they have a tendency to put value on financial analyses that are unable to reflect accurately the benefits of intangible resources (Molnar, 2004). Secondly, the relative significance of intellectual capital dimensions to be driven from this research pave the way for managerial strategies and showing the right direction towards effective and appropriate resource allocation. Managers may prefer to invest in a specific dimension of IC since entities are encountering scarce resources nowadays. Accordingly, managers make every endeavor to choose and invest in the most appropriate component of IC to obtain performance more effectively (Roos, 1998). In addition, recognizing the diverse type of intangible resources as the critical drivers of organizational performance makes it possible for a firm to reap maximum benefit of the intangible assets. For instance, when some IC factors are substituted for one another, it is not required to employ them at the same time for achieving desirable outcomes eventually. If this is not the case, it may lead to decreased performance at the margin (Rothaermel & Hess, 2007). Conversely, an intangible resource could be

integrated with its supporting resources if some IC factors are complements, thereby receiving an extra boost in performance (Rothaermel & Hess, 2007). To sum up, a multidimensional and comprehensive conceptualization of IC would assist executives to remedy the inefficiency in the exploitation of IC (Edvinsson & Sullivan, 1996), and provide a robust system in order to measure and capture IC and the generated performance (Molnar, 2004).

Additionally, current study contributes as a guideline for practitioners and organizations from another angle. They could gain deeper insight into the formation and management of intellectual capital, and what types of control systems in general and PMS in particular could support and facilitate the management of organization's underlying strategic resources and eventually boost IC's contribution to firm performance. That is, this study provides some useful guidance to practitioners and organizations in adopting suitable management accounting practices (including the type and design of PMS) particularly appropriate for the level of IC in an organization, with the purpose of taking full advantage of their intangible assets. This corroborates the idea of Widener (2006) who argued that once organizations acquire their strategic resources and capabilities, appropriate PMS would be employed in order to assist in the capturing and managing such vital resources. An important implication of this underlines the fact that where a higher emphasis on IC and knowledge-related resources takes place it might need a different stress on PMS design and nature in comparison with organizations where they de-emphasize such resources. It is imperative that administration identify and take appropriate action based on this for the purpose of boosting organizational effectiveness ultimately.

This research also carries another significant implication for practitioners. Indeed, it is absolutely necessary for managers to identify the value drivers within firms and comprehend the causal links which are crucial in driving that value (Epstein, 2002). This research highlights the importance of intangible resources as well as PMS as the critical factors and drivers towards value creation. Besides, it underlines another important point within IC framework which show the potential of culture and trust (as drivers and enablers) to contribute to intellectual capital development. In addition, the performance to be augmented with PMS is not only attributable to the adoption and usage of financial and non-financial measures. Instead, the benefits and positive outcomes of performance measurement system in the company may stem from the joint or balanced use of diagnostic and interactive PMS simultaneously.

To sum up, the linkages among intellectual capital, PMS, and organizational performance could provide a guideline for organizations and give the direction towards achieving competitive advantage by deploying compatible performance measurement system in parallel with the level of intellectual capital development. Moreover, the level and shape of intangible resources provide a checklist for companies to assess themselves in line with the extent to which they implement the management accounting practices necessary to support the management and development of such knowledge resources and capabilities. Furthermore, understanding the impact of IC and PMS on corporate performance would help executives in identifying their strategies in future development. It also underlines this fact for the managers that IC is vital for success of companies operating in turbulent and uncertain environments. To conclude, it is very imperative for managers to reconsider the conventional management accounting activities and they

ought to be eager to ignore the practices which worked well in the industrial and retail economy and move in parallel with the changes of the knowledge-based economy. Beside, managers are advised on the importance of organizational culture and trust as two effective enabler of intellectual capital which eventually would bring about positive organizational outcomes.

The following recommendations are put forwarded to practitioners, companies, and academics in consistent with the results of the current study. Practitioners and organizations are recommended to select suitable management accounting practices and methods apposite to the levels of intellectual capital in a specific company, for the purpose of reaping maximum advantages of their own intangible resources. Besides, this research may provide a guide regarding the type of organizational factors and features such as culture and trust which are able to play an important role in maximizing the value of intellectual capital which in turn lead to organizational performance improvement at the end.

Given the fact that there is a shortage of external reporting of intellectual capital disclosure, companies are advised to measure and disclosure their IC along with their annual reports. In this case, the users of the information would be able to accurately assess the companies' real values, as proposed by Petty and Guthrie (1999).

Companies possessing greater knowledge resources must attach more importance to innovative and strategic PMS including the interactive-oriented PMS use (which lay emphasis on learning and innovation), as well as the usage of multiple performance measures, among others, scorecard measures. Such

performance measurement is pivotal to the strategic decisions within organization. For instance, the scorecard covers nonfinancial measures as well which are considered as strategic information for organizations' performance as a whole. These nonfinancial indicators are a supplement to the financial methods, as they are not able to capture the intangible resources' contribution (Usoff et al., 2002).

It is observed that superior performance levels are strongly correlated with companies with greater intangible resources, companies with greater usage of diversity of measurement, and finally organizations those emphasized the balance use of interactive and diagnostic PMS. Consequently, companies are recommended augmenting their IC and also increasing the usage of more innovative approaches of PMS for the purpose of obtaining greater performance levels.

Companies are advised to provide educational opportunities and plans for their board of directors, employees, and shareholders regarding intellectual capital and its considerable significance for the organizations. This would support practitioners by guiding them towards effective implementation of intellectual capital, not merely in relation to management accounting and control system, but also in the other contexts and practices. The top management and shareholders would merely look for financial reports on performance if they do not comprehend intellectual capital properly. In this case, therefore, financial managers may perceive that there is no need for making especial effort to provide the complex non-financial performance report.

As mentioned earlier and according to Petty and Guthrie (2000), the preliminary stage of intellectual capital research provides new opportunities for

scholars to make positive contributions which are threefold and embrace several different aspects (i.e. from theoretical, methodological, and empirical angles). Practitioners and organizations are advised to carry out more studies on intellectual capital besides the R&D for research on innovations and market research for brands. In this respect, practitioners should consider and include all the four elements of intellectual capital in line with their relevance to the organizations themselves.

According to Gröjer (2001), the International Accounting Standards Board which is the independent, accounting standard-setting body already tried to establish a standard for developing intangible assets report. In this regard, the board must makes calls to take immediate action towards developing IC disclosure given the fact that accounting needs progress in parallel with the rapid growth and change in today's information-age era for ensuring the reliability of the corporate financial reporting, or rather the corporate performance reporting, and to keep the relevance of accountants.

According to Petty and Guthrie (2000), as explained in the practical advices, academic must be motivated as well. Intellectual capital research is appeared to be in a preliminary stage; and accordingly it is expected this project will stimulate future scholars towards embarking more research in the context of intellectual capital.

6.6 Limitations of the Study and Suggestions for Further Research

"No matter how hard one tries to be perfect, perfection is nothing we could ever reach". In spite of its contributions, this research is also subject to some

potential limitations in terms of internal and external validity. These limitations could be considered in subsequent studies which may focus on studying the relationships among variables used in this study as well as in related areas of research.

First and foremost, the instrument of the study was the questionnaire survey which this consequently made the study as a whole relies seriously on the perception and opinions of companies' chief financial officers who participated in the survey as the key informants. Even now the research's instrument was tested either in terms of the reliability or the validity, there should exist some type of bias when the key informants assess their own performance. The bias could have been alleviated if external parties such as customers, suppliers, allied partners, and competitors, who are classified under the organization's relational networks, were questioned to assess the firm's performance. Besides, it would be beneficial if there was a possibility to analyze the annual reports to verify the information provided by the respondents. In that case, the quite high number of organizations puts obstacle in the way of the researcher trying to do so. Another reason for this is that although performance was evaluated via a subjective instrument, both financial and non-financial indicators were included. That is, performance was addressed and measured along multiple dimensions under two broad categories (financial and non-financial performance) rather than on any single dimension. However, the findings must be interpreted with caution concerning the possibility of bias despite the fact ample evidence corroborated the consistent results between objective and subjective measurement.

Secondly, the data presented in this research is regarded cross-sectional or one-shot. Those critical factors were captured and measured just once and at a static point instead of as they were developing, thereby missing the value of time explanation. It is imperative to attach importance to long-term effects, particularly on the creation and development of the intellectual capital as well as the evolution of PMS and organizational culture. Besides, survey data derived from cross-sectional analyses is incapable of producing conclusive evidence of causality. Instead, the evidence should be regarded in line with theoretical arguments and expected associations. Future research could embark longitudinal survey in order to investigate the causality and interrelationships among factors which are pivotal to intellectual capital and PMS.

Thirdly, the data was collected in a single country (Iran). Potential culture limitations should be noted, especially the cultural differences among developing countries and developed nations that influence the perceptions of knowledge sharing and management accounting practices. The framework of the study must be examined further through including samples from other countries to generalize or modify the concepts. In addition, national cultural differences potentially could affect manpower's perceptions in relation to some important activities related to intellectual capital (e.g. knowledge sharing) and further investigation could offer a more conclusive hypotheses-testing. Moreover, concerning the concept of organizational culture, despite an acceptable reliability and validity of the instruments, richness could not be completely acquired via a survey instrument as organizational culture is perceived as a broad construct.

Fourth, having single-informant per firm is another limitation. Future research may also focus more explicitly on micro-foundations of routines, for example, by obtaining self-reports of the level of knowledge resources from the managers of other departments and divisions such as human resource, R & D, and etc. While gaining multiple respondent data per organization is challenging, it would allow for a more rigorous testing of micro-foundation to intellectual capital and its contributions towards positive organizational outcomes.

Furthermore, the model encompasses only one use of PMS (the balanced use of interactive and diagnostic PMS) and only one element of culture. The other alternative and possible uses and elements including interactive and diagnostic use individually could be investigated which could bring interesting results. Future studies may cover broader angles of PMS use (for example strategic decision makings, incentives, monitoring, learning, attention focusing, and legitimization) as well as other pairs of competing values regarding organizational culture (for instance people versus organization dilemma). Furthermore, more analyses are needed to gain deeper insight into the way that how dynamic tension is handled and reinforced on a routine base by managers at various levels. The model developed by Lewis (2000) may offer some guidance to comprehend the reinforcing cycles (such as splitting, projection, repression) and the handle of tension (e.g., acceptance, confrontation, transcendence). It is imperative to know that how the actions needed to balance diagnostic and interactive use differ in parallel with change in organizational contexts (for instance, strategic change, structural change, cultural change) and environmental contexts (e.g., new opportunities or threats, intensification of competition, new regulation). In this respect, qualitative methods will be specifically helpful to give detailed account and shed light on these issues.

Finally, this study focuses on merely one dimension of management accounting and control system (i.e. PMS) whereas other major dimensions of MACS (such as budget, capital investment, project management, etc.) may yield comparable or dissimilar results. Accordingly, potential research may examine the model of this with supplementing the other aforementioned dimensions of MACS.

6.7 Conclusion

Intellectual capitals and knowledge assets are becoming increasingly pivotal to organizations as drivers of their competitive advantage and firm-level strategy (Lev, 2001). Such precious assets are often embedded in human capital (e.g., knowledge), structural capital (e.g., patents), relational capital (relationships with external parties such as customers and suppliers and so forth), and social capital (informal manpower interactions and networks within firm) that could not be measured in organizations' conventional accounting system. In effect, there are rather few researches which focus on management accounting in general and PMS in particular in relation to IC. In parallel with increasing attention towards accounting for IC and higher academic stress on external reporting, this research addresses the intellectual capital in relation to MACS. With the foregoing discussion, one interesting question to explore is whether the level of intellectual capital is related to the extent use of particular PMS either in terms of the diversity of performance measures or the balanced use of PMS in diagnostic and interactive fashion. Moreover, the research addressed the question of whether the level and shape of intellectual capital within organization impact organizational performance. Finally, whether the two aforesaid aspects of PMS mediate the relationship between intellectual capital and organizational performance.

This study suggests findings according to a sample of Iranian public listed companies which indicated that some companies reflected greater levels of intellectual capital (encompasses human, structural, relational, and social capital) but with some significant variation among participants. Findings suggest that there is a significant relationship between the extent of investment in intellectual capital overall and organizational performance. Besides, IC level is strongly related to the extent use of particular performance measurement usage either in terms of diversity of measurement or the balanced use of PMS. That is, companies reflecting higher level of IC tend to employ more innovative PMS including the more diversity of measurement as well as more balanced use of interactive and diagnostic PMS. More importantly, the findings revealed that the emphasis lay upon the use of those contemporary PMS matters given the fact that they mediate the association between the intellectual capital and organizational performance. As expected, organizations reflecting more level of intellectual capital, and in turn, tend to put value on the use of multiple performance measures as well as the balance use of interactive and diagnostic PMS would achieve significantly superior performance.

As explained earlier, the findings of the study corroborate the idea of Tayles et al. (2007) who argued that managers of knowledge-intensive organizations should be capable of planning and formulating knowledge-based strategies, communicating and showing the “value relevance” of such strategies. After that by an integration of financial and non-financial techniques they must develop suitable MACS in general and PMS in particular, thereby ensuring those strategies are realized. Furthermore, the results overall are in the harmony with the views about the complexity of measuring intellectual capital that influences MAP in terms of performance measurement system (Bourne & Bourne, 2000; Norreklit, 2000;

O'Hanlon & Peasnell, 1998). Given the fact that intellectual capital is an intangible asset which is not quantifiable, organizations need to utilize suitable MACS approaches for the purpose of capturing its real contribution and value. Appropriate MACS would provide the relevant and vital information and assist organizations in taking strategic decisions which in turn bring about superior performance. Thus, the significance of these findings lies in the fact that high IC companies need to employ PMS which is appropriate to the levels of intellectual capital in order to take full advantage of their most valuable strategic resources and capabilities which in turn could bring about desirable outcomes in today's hypercompetitive environment.

Moreover, it is argued that intellectual capital resources are often context specific, idiosyncratic and interconnected (Marr et al., 2004) so no perfect solution is possible. This implies that intellectual capital may not be always appropriate and might be contingent upon the context and so, the level of intellectual capital within organizations may differ significantly (Huang et al., 2010). This drives us to the contingency theory. Thus, relying on the one of the seminal conceptualizations of IC proposed by Bontis (1999) and from the contingency lens, this study set out to determine the effect of two contingent antecedent factors, namely organizational culture and trust on the level of others four IC components. The results provided evidence that organizations reflecting a flexibility values tend to have a higher level of intellectual capital than firms reflecting a control dominant type. The findings significantly underline this fact that culture plays a leading part in relation to IC development overall. Also, organizations reflecting a greater extent of trust tend to have a higher level of intellectual capital in terms of human capital, relational capital, and social capital. These results strongly highlight the pivotal role of trust

in supporting the development of the underlying components of intellectual capital overall within Iranian organizations.

6.8 Summary

In a nutshell, this chapter discussed that to what extent the analysis was performed and the results reported in the previous chapter are able to provide answers to the research questions for determining the achievement of the research objectives. In this respect, the chapter commenced with reviewing the data analysis derived from chapter five. The key findings of the study were discussed in accordance with the research's objectives and those findings were compared with the results of similar previous research. The potential theoretical and managerial contributions were presented afterwards. Some of the limitations of the research were also discussed. Subsequently, several recommendations were highlighted based on the research findings. Finally, the chapter ended with a brief explanation in order to draw a general conclusion about the thesis overall.

LIST OF REFERENCES

Aaker, David A, Kumar, V, & Day, George S. (2007). *Marketing research*: Wiley Hoboken, NJ.

Abdallah, Wagdy Moustafa. (2001). *Managing multinationals in the Middle East: Accounting and tax issues*: Greenwood Publishing Group.

Abernethy, Margaret A, & Bouwens, Jan. (2005). Determinants of accounting innovation implementation. *Abacus, 41*(3), 217-240.

Agarwal, Ritu, & Karahanna, Elena. (2000). Time flies when you're having fun: cognitive absorption and beliefs about information technology usage 1. *MIS quarterly, 24*(4), 665-694.

Alavi, Maryam, Kayworth, Timothy R, & Leidner, Dorothy E. (2006). An empirical examination of the influence of organizational culture on knowledge management practices. *Journal of Management Information Systems, 22*(3), 191-224.

Alavi, Maryam, & Leidner, Dorothy E. (2001). Review: Knowledge management and knowledge management systems: Conceptual foundations and research issues. *MIS quarterly*, 107-136.

Aldrich, Howard, & Auster, Ellen R. (1986). Even dwarfs started small: Liabilities of age and size and their strategic implications. *Research in organizational behavior*.

Amaratunga, Dilanthi, Baldry, David, & Sarshar, Marjan. (2001). Process improvement through performance measurement: the balanced scorecard methodology. *Work Study, 50*(5), 179-189.

Amason, Allen C. (1996). Distinguishing the effects of functional and dysfunctional conflict on strategic decision making: Resolving a paradox for top management teams. *Academy of management journal, 39*(1), 123-148.

Amir, Eli, & Lev, Baruch. (1996). Value-relevance of nonfinancial information: The wireless communications industry. *Journal of accounting and economics, 22*(1), 3-30.

Amit, Raphael, & Schoemaker, Paul JH. (1993). Strategic assets and organizational rent. *Strategic management journal, 14*(1), 33-46.

Andaleeb, Syed Saad. (1996). An experimental investigation of satisfaction and commitment in marketing channels: the role of trust and dependence. *Journal of retailing, 72*(1), 77-93.

Anderson, Erin, & Weitz, Barton. (1992). The use of pledges to build and sustain commitment in distribution channels. *Journal of marketing research*, 18-34.

Anderson, James C, & Gerbing, David W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological bulletin, 103*(3), 411.

Andriessen, Daniel. (2004). IC valuation and measurement: classifying the state of the art. *Journal of intellectual capital, 5*(2), 230-242.

Anthony, Robert Newton. (1965). Planning and control systems: a framework for analysis.

Argote, Linda, & Ingram, Paul. (2000). Knowledge transfer: A basis for competitive advantage in firms. *Organizational behavior and human decision processes, 82*(1), 150-169.

Argote, Linda, McEvily, Bill, & Reagans, Ray. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management science, 49*(4), 571-582.

Argyris, Chris, & Schon, Donald. (1978). Organizational Learning: A theory of action approach. *Reading, MA: Addision Wesley*.

Ariely, G. (2003). Knowledge management as a methodology towards intellectual capital. *3rd European knowledge management summer school*, 7-12.

Arora, Ashish, & Gambardella, Alfonso. (1990). Complementarity and external linkages: the strategies of the large firms in biotechnology. *The Journal of Industrial Economics*, 361-379.

Astley, W Graham, & Fombrun, Charles J. (1983). Collective Strategy: Social Ecology of Organizational Environments. *Academy of management review, 8*(4), 576-587.

Atkinson, Anthony A, Waterhouse, John H, & Wells, Robert B. (1997). A stakeholder approach to strategic performance measurement. *Sloan management review, 38*(3), 25-37.

Atkinson, Anthony, Banker, Rajiv D, Kaplan, Robert S, & Young, SM. (1995). Management Accounting Prentice Hall. *Englewood, Cliffs, NJ*.

Atkinson, Giles. (2000). Measuring corporate sustainability. *Journal of Environmental Planning and management, 43*(2), 235-252.

Bacon, Donald R, Sauer, Paul L, & Young, Murray. (1995). Composite reliability in structural equations modeling. *Educational and Psychological Measurement, 55*(3), 394-406.

Bagozzi, Richard P, & Edwards, Jeffrey R. (1998). A general approach for representing constructs in organizational research. *Organizational Research Methods, 1*(1), 45-87.

Bagozzi, Richard P, & Heatherton, Todd F. (1994). A general approach to representing multifaceted personality constructs: Application to state self-esteem. *Structural Equation Modeling: A Multidisciplinary Journal, 1*(1), 35-67.

Baines, Annette, & Langfield-Smith, Kim. (2003). Antecedents to management accounting change: a structural equation approach. *Accounting, organizations and society, 28*(7), 675-698.

Baker, Kathryn A. (2002). . Organizational Culture1.

Balogun, Julia, & Jenkins, Mark. (2003). Re-conceiving change management:: A knowledge-based perspective. *European Management Journal, 21*(2), 247-257.

Banker, Rajiv D, Potter, Gordon, & Srinivasan, Dhinu. (2000). An empirical investigation of an incentive plan that includes nonfinancial performance measures. *The Accounting Review, 75*(1), 65-92.

Barclay, Donald, Higgins, Christopher, & Thompson, Ronald. (1995). The partial least squares (PLS) approach to causal modeling: personal computer adoption and use as an illustration. *Technology studies, 2*(2), 285-309.

Barney, Jay. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), 99-120.

Baron, Reuben M, & Kenny, David A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173.

Barrett, M Edgar, & Fraser, LB. (1977). Conflicting roles in budgeting for operations. *Harvard Business Review, 55*(4), 137-146.

Barsky, Noah P, & Bremser, Wayne G. (1999). Performance measurement, budgeting and strategic implementation in the multinational enterprise. *Managerial Finance, 25*(2), 3-15.

Bartlett, JE, & Kotrlik, J. W. & Higgins, CC (2001). *Organizational Research-Determining Appropriate Sample Size in Survey Research*, 43-50.

Baumgartner, Hans, & Homburg, Christian. (1996). Applications of structural equation modeling in marketing and consumer research: a review. *International Journal of Research in Marketing, 13*(2), 139-161.

Becker, Thomas E, Billings, Robert S, Eveleth, Daniel M, & Gilbert, Nicole L. (1996). Foci and bases of employee commitment: Implications for job performance. *Academy of management journal, 39*(2), 464-482.

Behling, Orlando, & Law, Kenneth S. (2000). *Translating questionnaires and other research instruments: Problems and solutions* (Vol. 133): SAGE Publications, Incorporated.

Bentler, PM, & Wu, EJC. (1995). EQS for Macintosh user" s guide. Encino. CA: Multivariate Software: Inc.

Berry, John. (2004). *Tangible Strategies for Intangible Assets: How to Manage and Measure Your Company's Brand, Patents, Intellectual Property, and Other Sources of Value*: McGraw-Hill Companies.

Bhimani, Alnoor. (2003). A study of the emergence of management accounting system ethos and its influence on perceived system success. *Accounting, Organizations and Society, 28*(6), 523-548.

Bhimani, Alnoor, & Langfield-Smith, Kim. (2007). Structure, formality and the importance of financial and non-financial information in strategy development and implementation. *Management Accounting Research, 18*(1), 3-31.

Bieker, Thomas, & Waxenberger, Bernhard. (2002). *Sustainability balanced scorecard and business ethics.* Paper presented at the greening of industry network conference.

Bierly, P, & Daly, Paula. (2002). Aligning human resource management practices and knowledge strategies. *The strategic management of intellectual capital and organizational knowledge*, 277-295.

Bigley, Gregory A, & Pearce, Jone L. (1998). Straining for shared meaning in organization science: Problems of trust and distrust. *Academy of Management Review, 23*(3), 405-421.

Birnberg, JG. (1998). Some reflections on the evolution of organizational control. *Behavioral Research in Accounting, 10*, 27-46.

Bisbe, Josep, Batista-Foguet, Joan-Manuel, & Chenhall, Robert. (2007). Defining management accounting constructs: a methodological note on the risks of conceptual misspecification. *Accounting, organizations and society, 32*(7), 789-820.

Bisbe, Josep, & Otley, David. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, organizations and society, 29*(8), 709-737.

Bontis, Nick. (1998). Intellectual capital: an exploratory study that develops measures and models. *Management decision, 36*(2), 63-76.

Bontis, Nick. (1999). Managing organisational knowledge by diagnosing intellectual capital: framing and advancing the state of the field. *International Journal of technology management, 18*(5), 433-462.

Bontis, Nick. (2001). Assessing knowledge assets: a review of the models used to measure intellectual capital. *International journal of management reviews, 3*(1), 41-60.

Bontis, Nick. (2004). National intellectual capital index: a United Nations initiative for the Arab region. *Journal of Intellectual Capital, 5*(1), 13-39.

Bontis, Nick, Crossan, Mary M, & Hulland, John. (2002). Managing an organizational learning system by aligning stocks and flows. *Journal of management studies, 39*(4), 437-469.

Bontis, Nick, Dragonetti, Nicola C, Jacobsen, Kristine, & Roos, Göran. (1999). The knowledge toolbox:: A review of the tools available to measure and manage intangible resources. *European management journal, 17*(4), 391-402.

Bontis, Nick, & Fitz-Enz, Jac. (2002). Intellectual capital ROI: a causal map of human capital antecedents and consequents. *Journal of Intellectual Capital, 3*(3), 223-247.

Bontis, Nick, & Girardi, John. (2000). Teaching knowledge management and intellectual capital lessons: an empirical examination of the TANGO simulation. *International Journal of Technology Management, 20*(5), 545-555.

Bontis, Nick, Keow, William Chua Chong, & Richardson, Stanley. (2000). Intellectual capital and business performance in Malaysian industries. *Journal of intellectual capital, 1*(1), 85-100.

Bourgeois, L Jay, & Eisenhardt, Kathleen M. (1988). Strategic decision processes in high velocity environments: four cases in the microcomputer industry. *Management science, 34*(7), 816-835.

Bourne, MCS, & Bourne, PA. (2000). *Understanding the Balanced Scorecard in a week*: Hodder & Stoughton.

Bourne, Mike, Mills, John, Wilcox, Mark, Neely, Andy, & Platts, Ken. (2000). Designing, implementing and updating performance measurement systems. *International Journal of Operations & Production Management, 20*(7), 754-771.

Bratianu, Constantin. (2007). The learning paradox and the university. *Journal of Applied Quantitative Methods, 2*(4), 375-386.

Bratianu, Constantin, Jianu, Ionela, & Vasilache, Simona. (2011). Integrators for organisational intellectual capital. *International Journal of Learning and Intellectual Capital, 8*(1), 5-17.

Brickley, James A, Smith, Clifford W, Zimmerman, Jerold L, Zhang, Zhiqiang, & Wang, Chunxiang. (2001). Managerial economics and organizational architecture.

Brislin, Richard W. (1970). Back-translation for cross-cultural research. *Journal of cross-cultural psychology, 1*(3), 185-216.

Brockman, Beverly K, & Morgan, Robert M. (2003). The role of existing knowledge in new product innovativeness and performance. *Decision Sciences, 34*(2), 385-419.

Brooking, Annie. (1996). *Intellectual capital*: Thomson Learning.

Buckman, Robert H. (2004). *Building a knowledge-driven organization*: McGraw-Hill Blacklick, OH.

Burchell, Stuart, Clubb, Colin, Hopwood, Anthony, Hughes, John, & Nahapiet, Janine. (1980). The roles of accounting in organizations and society. *Accounting, Organizations and Society, 5*(1), 5-27.

Burns, Robert B, & Bursn, Robert B. (2000). Introduction to research methods.

Burns, Tom, & Stalker, George Macpherson. (1961). The management of innovation. *University of Illinois at Urbana-Champaign's Academy for Entrepreneurial Leadership Historical Research Reference in Entrepreneurship*.

Cabrita, Maria Do Rosario, & Bontis, Nick. (2008). Intellectual capital and business performance in the Portuguese banking industry. *International Journal of Technology Management, 43*(1), 212-237.

Cameron, Kim S. (1986). Effectiveness as paradox: Consensus and conflict in conceptions of organizational effectiveness. *Management science, 32*(5), 539-553.

Campbell, Donald T, & Fiske, Donald W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological bulletin, 56*(2), 81.

Cardinal, Laura B. (2001). Technological innovation in the pharmaceutical industry: The use of organizational control in managing research and development. *Organization Science, 12*(1), 19-36.

Cavana, Robert Y, Delahaye, Brian L, & Sekaran, U. (2001). Applied business research. *Qualitative and Quantitative Methods*.

Cezair, Joan A. (2008). Intellectual Capital Hiding In Plain View. *Journal Of Performance Management, 21*(2), 29-39.

Cha, Eun-Seok, Kim, Kevin H, & Erlen, Judith A. (2007). Translation of scales in cross-cultural research: issues and techniques. *Journal of Advanced Nursing, 58*(4), 386-395.

Chaminade, Cristina, & Johanson, Ulf. (2003). Can guidelines for intellectual capital management and reporting be considered without addressing cultural differences? *Journal of intellectual Capital, 4*(4), 528-542.

Chan, Kin Hang. (2009). Impact of intellectual capital on organisational performance: an empirical study of companies in the Hang Seng Index (part 1). *Learning Organization, The, 16*(1), 4-21.

Chapman, Christopher S. (1997). Reflections on a contingent view of accounting. *Accounting, Organizations and Society, 22*(2), 189-205.

Chauhan, Neel, & Bontis, Nick. (2004). Organisational learning via groupware: a path to discovery or disaster? *International Journal of Technology Management, 27*(6), 591-610.

Chen, Ming-Chin, Cheng, Shu-Ju, & Hwang, Yuhchang. (2005). An empirical investigation of the relationship between intellectual capital and firms' market value and financial performance. *Journal of Intellectual capital, 6*(2), 159-176.

Chenhall, Robert H. (1997). Reliance on manufacturing performance measures, total quality management and organizational performance. *Management Accounting Research, 8*(2), 187-206.

Chenhall, Robert H. (2003). Management control systems design within its organizational context: findings from contingency-based research and directions for the future. *Accounting, organizations and society, 28*(2), 127-168.

Chenhall, Robert H. (2004). The role of cognitive and affective conflict in early implementation of activity-based cost management. *Behavioral Research in Accounting, 16*(1), 19-44.

Chenhall, Robert H. (2005). Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: an exploratory study. *Accounting, Organizations and Society, 30*(5), 395-422.

Chenhall, Robert H, & Langfield-Smith, Kim. (1998). The relationship between strategic priorities, management techniques and management accounting: an empirical investigation using a systems approach. *Accounting, Organizations and Society, 23*(3), 243-264.

Chenhall, Robert H, & Morris, Deigan. (1986). The impact of structure, environment, and interdependence on the perceived usefulness of management accounting systems. *Accounting Review*, 16-35.

Chenhall, ROBERT H, & Morris, DEIGAN. (1995). Organic decision and communication processes and management accounting systems in entrepreneurial and conservative business organizations. *Omega, 23*(5), 485-497.

Chin, Wynne W, Marcolin, Barbara L, & Newsted, Peter R. (2003). A partial least squares latent variable modeling approach for measuring interaction effects: Results from a Monte Carlo simulation study and an electronic-mail emotion/adoption study. *Information systems research, 14*(2), 189-217.

Choi, Won W, Kwon, Sung S, & Lobo, Gerald J. (2000). Market valuation of intangible assets. *Journal of Business Research, 49*(1), 35-45.

Chong, Vincent K, & Chong, Kar Ming. (1997). Strategic choices, environmental uncertainty and SBU performance: a note on the intervening role of management accounting systems. *Accounting and Business Research, 27*(4), 268-276.

Choo, Chun Wei, & Bontis, Nick. (2002). *The strategic management of intellectual capital and organizational knowledge*: Oxford University Press.

Chow, Chee W, Shields, Michael D, & Wu, Anne. (1999). The importance of national culture in the design of and preference for management controls for multi-national operations. *Accounting, Organizations and Society, 24*(5), 441-461.

Christensen, Peter O, Feltham, Gerald A, & Şabac, Florin. (2003). Dynamic incentives and responsibility accounting: A comment. *Journal of Accounting and Economics, 35*(3), 423-436.

Chua, Wai Fong. (1986). Radical developments in accounting thought. *Accounting Review*, 601-632.

Chwelos, Paul, Benbasat, Izak, & Dexter, Albert S. (2001). Research report: empirical test of an EDI adoption model. *Information systems research, 12*(3), 304-321.

Clark, Kim B. (1991). *Product development performance: strategy, organization and management in the world auto industry*: Harvard Business Press.

Clarke, Martin, Seng, Dyna, & Whiting, Rosalind H. (2011). Intellectual capital and firm performance in Australia. *Journal of Intellectual Capital, 12*(4), 505-530.

Claycomb, Cindy, Dröge, Cornelia, & Germain, Richard. (2001). Applied process knowledge and market performance: the moderating effect of environmental uncertainty. *Journal of Knowledge Management, 5*(3), 264-278.

Cleary, Peter, Kennedy, Tom, O'Donnell, David, & O'Regan, Philip. (2007). Positioning management accounting on the intellectual capital agenda. *International Journal of Accounting, Auditing and Performance Evaluation, 4*(4), 336-359.

Coff, Russell W. (1997). Human assets and management dilemmas: Coping with hazards on the road to resource-based theory. *Academy of Management Review*, 374-402.

Cohen, Wesley M, & Levinthal, Daniel A. (1990). Absorptive capacity: a new perspective on learning and innovation. *Administrative science quarterly*, 128-152.

Cole, Gerald A. (2004). *Management: theory and practice*: Cengage Learning EMEA.

Combs, James G, Crook, T Russell, & Shook, Christopher L. (2005). The dimensionality of organizational performance and its implications for strategic management research. *Research methodology in strategy and management, 2*, 259-286.

Conner, Kathleen R, & Prahalad, CK. (2002). A resource-based theory of the firm. *The strategic management of intellectual capital and organizational knowledge*, 103-131.

Conner, Kathleen R, & Prahalad, Coimbatore K. (1996). A resource-based theory of the firm: Knowledge versus opportunism. *Organization science, 7*(5), 477-501.

Cooper, Donald R, & Emory, C William. (1995). Business Research Methods, Chicago: Richard D. Irwin: Inc.

Cooper, Donald R, & Schindler, Pamela S. (2003). Business research methods.

Crotty, Michael. (1998). *The foundations of social research: Meaning and perspective in the research process*: SAGE Publications Limited.

Davenport, Thomas H, & Prusak, Laurence. (1998). Working knowledge: Managing what your organization knows. *Harvard Business School Press, Boston, MA*.

David, W, & Fahey, Liam. (2000). Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive, 14*(4), 113-127.

David, W, Long, De, & Fahey, Liam. (2000). Diagnosing cultural barriers to knowledge management. *The Academy of Management Executive (1993-2005)*, 113-127.

Davis, Stan, & Albright, Tom. (2004). An investigation of the effect of balanced scorecard implementation on financial performance. *Management Accounting Research, 15*(2), 135-153.

De Carolis, D. (2002). The role of social capital and organizational knowledge in enhancing entrepreneurial opportunities in high-technology environments. *The strategic management of intellectual capital and organizational knowledge*, 699-709.

De Dreu, Carsten KW. (1997). Productive conflict: The importance of conflict management and conflict issue. *Using conflict in organizations*, 9-22.

De Haas, Marco, & Kleingeld, Ad. (1999). Multilevel design of performance measurement systems: enhancing strategic dialogue throughout the organization. *Management Accounting Research, 10*(3), 233-261.

de Pablos, Patricia Ordonez. (2002). Evidence of intellectual capital measurement from Asia, Europe and the Middle East. *Journal of Intellectual Capital, 3*(3), 287-302.

Delery, John E, & Doty, D Harold. (1996). Modes of theorizing in strategic human resource management: Tests of universalistic, contingency, and configurational performance predictions. *Academy of management Journal, 39*(4), 802-835.

Dent, Jeremy F. (1987). Tensions in the design of formal control systems: a field study in a computer company. *Accounting and management: field study perspectives*, 119-145.

Dent, Jeremy F. (1990). Strategy, organization and control: some possibilities for accounting research. *Accounting, Organizations and Society, 15*(1), 3-25.

Deshpandé, Rohit, Farley, John U, & Webster Jr, Frederick E. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis. *The journal of Marketing*, 23-37.

Dess, Gregory G, & Robinson, Richard B. (1984). Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit. *Strategic management journal, 5*(3), 265-273.

Devinney, Timothy M, Richard, Pierre J, Yip, George S, & Johnson, Gerry. (2005). Measuring organizational performance in management research: a synthesis of measurement challenges and approaches. *Research paper, www. aimresearch. org*.

Diamantopoulos, Adamantios, & Winklhofer, Heidi M. (2001). Index construction with formative indicators: an alternative to scale development. *Journal of Marketing research*, 269-277.

Dias-Sardinha, Idalina, & Reijnders, Lucas. (2005). Evaluating environmental and social performance of large Portuguese companies: a balanced scorecard approach. *Business Strategy and the Environment, 14*(2), 73-91.

Dillman, Don A. (1991). The design and administration of mail surveys. *Annual review of sociology*, 225-249.

Dixon, J Robb, Nanni, Alfred J, & Vollmann, Thomas E. (1990). *The new performance challenge: Measuring operations for world-class competition*: Dow Jones-Irwin Homewood, Illinois.

do Rosário Cabrita, Maria, & Vaz, Jorge Landeiro. (2005). Intellectual Capital and Value Creation: Evidence from the Por-tuguese Banking Industry. *Electronic Journal of Knowledge Management, 4*(1), 11-20.

Donaldson, Lex. (2001). *The contingency theory of organizations*: Sage.

Drazin, Robert, & Van de Ven, Andrew H. (1985). Alternative forms of fit in contingency theory. *Administrative science quarterly*, 514-539.

Drucker, Peter. (1993). Post-capital society. *New Yor: Butterworth Heineman*.

Drucker, Peter Peter Ferdinand, & Drucker, Peter F. (1993). *Managing for the Future*: Routledge.

Ducharme, L. (1998). Measuring intangible investment. *Paris: Organization for Economic Cooperation and Development*.

Dunk, Alan S, & Lysons, Arthur F. (1997). An analysis of departmental effectiveness, participative budgetary control processes and environmental dimensionality within the competing values framework: a public sector study. *Financial Accountability & Management, 13*(1), 1-15.

Dwyer, F Robert, Schurr, Paul H, & Oh, Sejo. (1987). Developing buyer-seller relationships. *The Journal of marketing*, 11-27.

Dyer, Jeffrey H, & Singh, Harbir. (1998). The relational view: Cooperative strategy and sources of interorganizational competitive advantage. *Academy of management review, 23*(4), 660-679.

Dzinkowski, Ramona. (2000). International Management Accounting Study: The measurement and management of intellectual capital. *MANAGEMENT ACCOUNTING-LONDON-, 78*(2), 32-37.

Easterby-Smith, M, Thorpe, R, & Lowe, A. (1991). Management research: An introduction Sage. *Beverly Hills, CA*.

Eccles, Robert G. (1991). The performance measurement manifesto. *Harvard business review, 69*(1), 131-137.

Edvinsson, Leif, & Malone, Michael S. (1997). Intellectual Capital: Realizing Your Company\'s True Value by Finding Its Hidden Brainpower.

Edvinsson, Leif, Roos, Johan, Roos, Göran, & Dragonetti, Nicola Carlo. (1997). Intellectual Capital: Navigating in the new business landscape: London: MacMillan Press.

Edvinsson, Leif, & Sullivan, Patrick. (1996). Developing a model for managing intellectual capital. *European management journal, 14*(4), 356-364.

Edwards, Jeffrey R, & Bagozzi, Richard P. (2000). On the nature and direction of relationships between constructs and measures. *Psychological methods, 5*(2), 155.

Ehin, Charles. (2000). *Unleashing intellectual capital*: Routledge.

Ellinger, Alexander E, Musgrove, Carolyn Casey Findley, Ellinger, Andrea D, Bachrach, Daniel G, Elmadağ Baş, Ayşe Banu, & Wang, Yu-Lin. (2012). Influences of organizational investments in social capital on service employee commitment and performance. *Journal of Business Research*.

English, Tony. (2001). Tension analysis in international organizations: a tool for breaking down communication barriers. *International Journal of Organizational Analysis, 9*(1), 58-83.

Epstein, Marc J, & Manzoni, Jean-François. (1997). *The Balanced Scorecard and Tableau de Bord: a global perspective on translating strategy into action*: Insead.

Epstein, Marc J, & Wisner, Priscilla S. (2001). Using a balanced scorecard to implement sustainability. *Environmental Quality Management, 11*(2), 1-10.

Evans, James R. (2004). An exploratory study of performance measurement systems and relationships with performance results. *Journal of Operations Management, 22*(3), 219-232.

Feltham, Gerald A, & Xie, Jim. (1994). Performance measure congruity and diversity in multi-task principal/agent relations. *Accounting review*, 429-453.

Ferguson-Amores, María C, García-Rodríguez, Manuel, & Ruiz-Navarro, Jośe. (2005). Strategies of Renewal The Transition from 'Total Quality Management'to the 'Learning Organization'. *Management Learning, 36*(2), 149-180.

Fernandes, Bruno H Rocha, Mills, John F, & Fleury, Maria Tereza L. (2005). Resources that drive performance: an empirical investigation. *International Journal of Productivity and Performance Management, 54*(5/6), 340-354.

Figge, Frank, Hahn, Tobias, Schaltegger, Stefan, & Wagner, Marcus. (2002). The sustainability balanced scorecard–linking sustainability management to business strategy. *Business strategy and the Environment, 11*(5), 269-284.

Fiol, C Marlene, & Lyles, Marjorie A. (1985). Organizational learning. *Academy of Management review, 10*(4), 803-813.

Firer, Steven, & Williams, S Mitchell. (2003). Intellectual capital and traditional measures of corporate performance. *Journal of Intellectual Capital, 4*(3), 348-360.

Fisher, Joseph. (1992). Use of nonfinancial performance measures. *Journal of Cost management, 6*(1), 31-38.

Fisher, Joseph G. (1998). Contingency theory, management control systems and firm outcomes: past results and future directions. *Behavioral Research in Accounting, 10*, 47-64.

Flaherty, Karen E, & Pappas, James M. (2000). The role of trust in salesperson—sales manager relationships. *The Journal of Personal Selling and Sales Management*, 271-278.

Flamholtz, Eric. (2002). La cultura empresarial y la cuenta de resultados. *Harvard Deusto Business Review*(107), 62-69.

Flamholtz, Eric G, Das, TK, & Tsui, Anne S. (1985). Toward an integrative framework of organizational control. *Accounting, Organizations and Society, 10*(1), 35-50.

Foray, Dominique. (2006). Optimizing the use of knowledge. *Advancing knowledge and the knowledge economy*, 9-16.

Fornell, Claes, & Larcker, David F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 39-50.

Foss, Nicolai J. (1997). *Resources, Firms, and Stratregies: A Reader in the Resource-based Perspective*: Oxford University Press.

Foster, Kevin R, & Kharazi, Ali. (2008). Contrarian and momentum returns on Iran's Tehran Stock Exchange. *Journal of International Financial Markets, Institutions and Money, 18*(1), 16-30.

Fukuyama, Francis. (1995). Social capital and the global economy. *Foreign affairs*, 89-103.

Fulk, Janet, & DeSanctis, Gerardine. (1995). Electronic communication and changing organizational forms. *Organization science, 6*(4), 337-349.

Gainey, Thomas W, & Klaas, Brian S. (2003). The outsourcing of training and development: Factors impacting client satisfaction. *Journal of Management, 29*(2), 207-229.

Galbraith, Jay R. (1973). *Designing complex organizations*: Addison-Wesley Longman Publishing Co., Inc.

Galbraith, Jay R. (1983). Designing the innovating organization. *Organizational dynamics, 10*(3), 5-25.

George, D, & Mallery, M. (2003). Using SPSS for Windows step by step: a simple guide and reference: Boston, MA: Allyn & Bacon.

Gerdin, Jonas. (2005). The impact of departmental interdependencies and management accounting system use on subunit performance. *European Accounting Review, 14*(2), 297-327.

Gerdin, Jonas, & Greve, Jan. (2004). Forms of contingency fit in management accounting research—a critical review. *Accounting, Organizations and Society, 29*(3), 303-326.

Gold, Andrew H, Malhotra, Arvind, & Segars, Albert H. (2001). Knowledge management: an organizational capabilities perspective. *J. of Management Information Systems, 18*(1), 185-214.

Goldberg, Lewis R. (1985). The Prediction of Semantic Consistency in Self-Descriptions: Characteristics of Persons and of Terms That Affect the. *Journal of Personality and Social Psychology, 48*(1), 82-93.

Goold, Michael, & Quinn, John J. (1990). The paradox of strategic controls. *Strategic Management Journal, 11*(1), 43-57.

Gordon, Lawrence A, & Miller, Danny. (1976). A contingency framework for the design of accounting information systems. *Accounting, Organizations and Society, 1*(1), 59-69.

Gosselin, Maurice. (1997). The effect of strategy and organizational structure on the adoption and implementation of activity-based costing. *Accounting, Organizations and Society, 22*(2), 105-122.

Govindarajan, Vijay. (1984). Appropriateness of accounting data in performance evaluation: an empirical examination of environmental uncertainty as an intervening variable. *Accounting, Organizations and Society, 9*(2), 125-135.

Govindarajan, Vijay. (1988). A contingency approach to strategy implementation at the business-unit level: Integrating administrative mechanisms with strategy. *Academy of management Journal, 31*(4), 828-853.

Govindarajan, Vijay, & Fisher, Joseph. (1990). Strategy, control systems, and resource sharing: Effects on business-unit performance. *Academy of Management Journal, 33*(2), 259-285.

Granovetter, Mark. (1985). Economic action and social structure: the problem of embeddedness. *American journal of sociology*, 481-510.

Grant, Robert M. (1996). Toward a knowledge-based theory of the firm. *Strategic management journal, 17*, 109-122.

Green, Paul E, Tull, Donald S, & Albaum, Gerald. (1988). Researchfor marketing decisions: Prentice-Hall, Inc., Englewood CliVs, NJ.

Green, Sebastian. (1988). Understanding corporate culture and its relation to strategy. *International Studies of Management & Organization, 18*(2), 6-28.

Greenley, Gordon E. (1995). Forms of market orientation in UK companies. *Journal of Management Studies, 32*(1), 47-66.

Grindley, Peter C, & Teece, David J. (1997). Managing intellectual capital: licensing and cross-licensing in semiconductors and electronics.

Gröjer, Jan-Erik. (2001). Intangibles and accounting classifications: in search of a classification strategy. *Accounting, Organizations and Society, 26*(7), 695-713.

Gul, Ferdinand A. (1991). The effects of management accounting systems and environmental uncertainty on small business managers' performance. *Accounting and Business Research, 22*(85), 57-61.

Gul, Ferdinand A, & Chia, Yew Ming. (1994). The effects of management accounting systems, perceived environmental uncertainty and decentralization on

managerial performance: a test of three-way interaction. *Accounting, Organizations and Society, 19*(4), 413-426.

Gupta, Anil K. (1987). SBU strategies, corporate-SBU relations, and SBU effectiveness in strategy implementation. *Academy of Management Journal, 30*(3), 477-500.

Gupta, Anil K, & Govindarajan, Vijay. (1984). Business Unit Strategy, Managerial Characteristics, and Business Unit Effectiveness at Strategy Implementation. *Academy of Management journal, 27*(1), 25-41.

Gupta, Anil K, & Govindarajan, Vijay. (2000). Knowledge flows within multinational corporations. *Strategic management journal, 21*(4), 473-496.

Guthrie, James. (2001). The management, measurement and the reporting of intellectual capital. *Journal of Intellectual capital, 2*(1), 27-41.

Hair, JF, Black, WC, & Babin, BJ. Anderson, re, & tatham, r. L.(2006). *Multivariate data analysis*.

Hair, Joe F, Ringle, Christian M, & Sarstedt, Marko. (2011). PLS-SEM: Indeed a silver bullet. *The Journal of Marketing Theory and Practice, 19*(2), 139-152.

Hair, Joseph F, Anderson, Rolph E, Tatham, Ronald L, & Black, William C. (1998). Multivariate analysis. *Englewood: Prentice Hall International*.

Hall, Richard. (1992). The strategic analysis of intangible resources. *Strategic management journal, 13*(2), 135-144.

Hamel, Gary. (1991). Competition for competence and interpartner learning within international strategic alliances. *Strategic management journal, 12*(S1), 83-103.

Hamel, Gary, & Prahalad, CK. (1994). *Competing for the future: Breakthrough strategies for seizing control of your industry and creating the markets of tomorrow*: Harvard business school press.

Hammad, Salah A, Jusoh, Ruzita, & Oon, Elaine Yen Nee. (2010). Management accounting system for hospitals: a research framework. *Industrial Management & Data Systems, 110*(5), 762-784.

Hansen, Gary S, & Wernerfelt, Birger. (1989). Determinants of firm performance: The relative importance of economic and organizational factors. *Strategic management journal, 10*(5), 399-411.

Harman, Harry H. (1976). *Modern factor analysis*: University of Chicago Press.

Hayes, Andrew F. (2009). Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs, 76*(4), 408-420.

Hayes, David C. (1977). The contingency theory of managerial accounting. *Accounting Review*, 22-39.

Hayes, R, Pisano, G, Upton, D, & Wheelwright, S. Operations, Strategy, and Technology: Pursuing the Competitive Edge, 2005: Wiley: Hoboken, NJ.

Helfat, Constance E, & Peteraf, Margaret A. (2003). The dynamic resource-based view: capability lifecycles. *Strategic management journal, 24*(10), 997-1010.

Henderson, Rebecca, & Cockburn, Iain. (1994). Measuring competence? Exploring firm effects in pharmaceutical research. *Strategic management journal, 15*(S1), 63-84.

Henri, Jean-François. (2006a). Management control systems and strategy: a resource-based perspective. *Accounting, organizations and society, 31*(6), 529-558.

Henri, Jean-François. (2006b). Organizational culture and performance measurement systems. *Accounting, organizations and society, 31*(1), 77-103.

Henseler, Jörg, Wilson, Bradley, Gotz, Oliver, & Hautvast, Caspar. (2007). Investigating the moderating role of fit on sports sponsorship and brand equity. *International Journal of Sports Marketing and Sponsorship, 8*(4).

Hofstede, George. (1978). The poverty of management control philosophy. *Academy of management Review, 3*(3), 450-461.

Hoque, Zahirul. (2004). A contingency model of the association between strategy, environmental uncertainty and performance measurement: impact on organizational performance. *International Business Review, 13*(4), 485-502.

Hoque, Zahirul. (2005). Linking environmental uncertainty to non-financial performance measures and performance: a research note. *The British Accounting Review, 37*(4), 471-481.

Hoque, Zahirul, & Adams, Carol Alison. (2008). Measuring Public Sector Performance: A study of government departments in Australia.

Hoque, Zahirul, & James, Wendy. (2000). Linking balanced scorecard measures to size and market factors: impact on organizational performance. *Journal of management accounting research, 12*(1), 1-17.

Hoque, Zahirul, Mia, Lokman, & Alam, Manzurul. (2001). Market competition, computer-aided manufacturing and use of multiple performance measures: an empirical study. *The British Accounting Review, 33*(1), 23-45.

Horngren, Charles T, Foster, George, Datar, Srikant M, Harris, John K, & Curry, Dudley W. (1997). *Cost accounting: a managerial emphasis* (Vol. 5): Prentice Hall New Jersey.

Horwitz, Frank M, Heng, Chan Teng, & Quazi, Hesan Ahmed. (2003). Finders, keepers? Attracting, motivating and retaining knowledge workers. *Human Resource Management Journal, 13*(4), 23-44.

Hoskisson, Robert E, Hitt, Michael A, Wan, William P, & Yiu, Daphne. (1999). Theory and research in strategic management: Swings of a pendulum. *Journal of management, 25*(3), 417-456.

Hsu, Chia-Wei, Hu, Allen H, Chiou, Cherng-Ying, & Chen, Ta-Che. (2011). Using the FDM and ANP to construct a sustainability balanced scorecard for the

semiconductor industry. *Expert Systems with Applications, 38*(10), 12891-12899.

Huang, Cheng Jen, & Liu, Chun Ju. (2005). Exploration for the relationship between innovation, IT and performance. *Journal of Intellectual Capital, 6*(2), 237-252.

Huang, Ching Choo, Tayles, Michael, & Luther, Robert. (2010). Contingency factors influencing the availability of internal intellectual capital information. *Journal of financial Reporting and Accounting, 8*(1), 4-21.

Huber, George P. (1991). Organizational learning: The contributing processes and the literatures. *Organization science, 2*(1), 88-115.

Hudson, William J. (1993). *Intellectual capital: How to build it, enhance it, use it*: J. Wiley.

Huff, Lenard, & Kelley, Lane. (2003). Levels of organizational trust in individualist versus collectivist societies: A seven-nation study. *Organization Science, 14*(1), 81-90.

Huff, Lenard, & Kelley, Lane. (2005). Is collectivism a liability? The impact of culture on organizational trust and customer orientation: a seven-nation study. *Journal of Business Research, 58*(1), 96-102.

Huizing, Ard, & Bouman, Wim. (2002). Knowledge and learning markets and organizations. *The strategic management of intellectual capital and organizational knowledge*, 185-204.

Hulland, John. (1999). Use of partial least squares (PLS) in strategic management research: a review of four recent studies. *Strategic management journal, 20*(2), 195-204.

Huselid, Mark A. (1995). The impact of human resource management practices on turnover, productivity, and corporate financial performance. *Academy of management journal, 38*(3), 635-672.

Iivari, Juhani, Hirschheim, Rudy, & Klein, Heinz K. (1998). A paradigmatic analysis contrasting information systems development approaches and methodologies. *Information Systems Research, 9*(2), 164-193.

Ilgen, Daniel R, Fisher, Cynthia D, & Taylor, M Susan. (1979). Consequences of individual feedback on behavior in organizations. *Journal of applied psychology, 64*(4), 349.

Index, CSC. (1994). *State of Reengineering Report: North America and Europe*: CSC Index.

Inkpen, Andrew C, & Currall, Steven C. (1998). The nature, antecedents, and consequences of joint venture trust. *Journal of International Management, 4*(1), 1-20.

Isaac, Robert G, Herremans, Irene M, & Kline, Theresa J. (2010). Intellectual capital management enablers: a structural equation modeling analysis. *Journal of business ethics, 93*(3), 373-391.

Isaac, Robert G, Herremans, Irene M, & Kline, Theresa JB. (2009). Intellectual capital management: pathways to wealth creation. *Journal of intellectual capital, 10*(1), 81-92.

Itami, Hiroyuki, & Roehl, Thomas W. (1991). *Mobilizing invisible assets*: Harvard University Press.

Ittner, Christopher D, & Larcker, David. (1998). Innovations in performance measurement: trends and research implications. *Journal of management accounting research*.

Ittner, Christopher D, & Larcker, David F. (2001). Assessing empirical research in managerial accounting: a value-based management perspective. *Journal of accounting and economics, 32*(1), 349-410.

Ittner, Christopher D, Larcker, David F, & Meyer, Marshall W. (2003). Subjectivity and the weighting of performance measures: Evidence from a balanced scorecard. *The Accounting Review, 78*(3), 725-758.

Ittner, Christopher D, Larcker, David F, & Rajan, Madhav V. (1997). The choice of performance measures in annual bonus contracts. *Accounting Review*, 231-255.

Ittner, Christopher D, Larcker, David F, & Randall, Taylor. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society, 28*(7), 715-741.

Jansen, Justin JP, Van Den Bosch, Frans AJ, & Volberda, Henk W. (2006). Exploratory innovation, exploitative innovation, and performance: Effects of organizational antecedents and environmental moderators. *Management science, 52*(11), 1661-1674.

Janz, Brian D, & Prasarnphanich, Pattarawan. (2003). Understanding the Antecedents of Effective Knowledge Management: The Importance of a Knowledge-Centered Culture*. *Decision sciences, 34*(2), 351-384.

Jarque, Carlos M, & Bera, Anil K. (1980). Efficient tests for normality, homoscedasticity and serial independence of regression residuals. *Economics Letters, 6*(3), 255-259.

Jarvis, Cheryl Burke, MacKenzie, Scott B, & Podsakoff, Philip M. (2003). A critical review of construct indicators and measurement model misspecification in marketing and consumer research. *Journal of consumer research, 30*(2), 199-218.

Jaworski, Bernard J, & Kohli, Ajay K. (1993). Market orientation: antecedents and consequences. *The Journal of marketing*, 53-70.

Johanson, Ulf, Mårtensson, Maria, & Skoog, Matti. (2001). Mobilizing change through the management control of intangibles. *Accounting, Organizations and Society, 26*(7), 715-733.

Johnson, H Thomas, & Kaplan, Robert S. (1987). The rise and fall of management accounting. *Engineering Management Review, IEEE, 15*(3), 36-44.

Johnson, Jean L, Cullen, John B, Sakano, Tomoaki, & Takenouchi, Hideyuki. (1996). Setting the stage for trust and strategic integration in Japanese-US cooperative alliances. *Journal of international business studies*, 981-1004.

Johnson, Scott D. (1998). Identification and selection of environmental performance indicators: application of the balanced scorecard approach. *Corporate Environmental Strategy, 5*(4), 34-41.

Joiner, Therese A, Spencer, X Sarah Yang, & Salmon, Suzanne. (2009). The effectiveness of flexible manufacturing strategies: the mediating role of performance measurement systems. *International Journal of Productivity and Performance Management, 58*(2), 119-135.

Jones, Gareth R, & George, Jennifer M. (1998). The experience and evolution of trust: Implications for cooperation and teamwork. *Academy of management review*, 531-546.

Joreskog, Karl G, & Wold, Herman. (1982). *Contributions to Economic Analysis-Systems Under Indirect Observation-Causality-Structure-Prediction*: North Holland.

Joshi, Mahesh, Cahill, Daryll, & Sidhu, Jasvinder. (2010). Intellectual capital performance in the banking sector: an assessment of Australian owned banks. *Journal of Human Resource Costing & Accounting, 14*(2), 151-170.

Jusoh, Rusita. (2008). Environmental uncertainty, performance, and the mediating role of balanced scorecard measures use: Evidence from Malaysia. *International Review of Business Research Papers, 4*(2), 116-135.

Jusoh, Ruzita, Ibrahim, Daing Nasir, & Zainuddin, Yuserrie. (2008). The performance consequence of multiple performance measures usage: evidence from the Malaysian manufacturers. *International Journal of Productivity and Performance Management, 57*(2), 119-136.

Jusoh, Ruzita, & Parnell, John A. (2008). Competitive strategy and performance measurement in the Malaysian context: An exploratory study. *Management Decision, 46*(1), 5-31.

Kang, Sung-Choon, & Snell, Scott A. (2009). Intellectual capital architectures and ambidextrous learning: a framework for human resource management. *Journal of Management Studies, 46*(1), 65-92.

Kannan, Gopika, & Aulbur, Wilfried G. (2004). Intellectual capital: measurement effectiveness. *Journal of Intellectual Capital, 5*(3), 389-413.

Kanter, Rosabeth Moss. (2001). *Evolve!: Succeeding in the digital culture of tomorrow*: Harvard Business Press.

Kaplan, Robert, & Norton, David P. (1996). *The balanced scorecard*: Harvard Business School Press.

Kaplan, Robert S, & Norton, David P. (2001). Transforming the balanced scorecard from performance measurement to strategic management: Part I. *Accounting horizons, 15*(1), 87-104.

Kaplan, Robert S, & Norton, David P. (2004). Measuring the strategic readiness of intangible assets. *Harvard business review, 82*(2), 52-63.

Karimi, Jahangir, Somers, Toni M, & Gupta, Yash P. (2004). Impact of environmental uncertainty and task characteristics on user satisfaction with data. *Information Systems Research, 15*(2), 175-193.

Kennedy, C. (2001). The next big idea: managing in the digital economy: London, Random House Business Books.

Kerr, Steven, & Slocum, John W. (1981). Controlling the performances of people in organizations. *Handbook of organizational design, 2*, 116-134.

Ketokivi, Mikko A, & Schroeder, Roger G. (2004). Perceptual measures of performance: fact or fiction? *Journal of Operations Management, 22*(3), 247-264.

Khajehpour, Bijan. (2000). Domestic political reforms and private sector activity in Iran. *Social Research*, 577-598.

Kinnear, Thomas C, & Taylor, James Ronald. (1987). *Marketing research: an applied approach* (Vol. 3): McGraw-Hill New York.

Klein, David A, & Prusak, Laurence. (1994). Characterizing intellectual capital. *Center for Business Innovation. New York: Ernst & Young LLP Working Paper*.

Kloot, Louise. (1997). Organizational learning and management control systems: responding to environmental change. *Management Accounting Research, 8*(1), 47-73.

Ko, Dong-Gil, Kirsch, Laurie J, & King, William R. (2005). Antecedents of knowledge transfer from consultants to clients in enterprise system implementations. *MIS quarterly*, 59-85.

Kogut, Bruce, & Zander, Udo. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization science, 3*(3), 383-397.

Koh, Christine, Ang, Soon, & Straub, Detmar W. (2004). IT outsourcing success: a psychological contract perspective. *Information Systems Research, 15*(4), 356-373.

Kohli, Ajay K, & Jaworski, Bernard J. (1990). Market orientation: the construct, research propositions, and managerial implications. *The Journal of Marketing*, 1-18.

Kotter, John P, & Heskett, James. l.(1992). *Corporate culture and performance*.

Krakower, Jack Y, & Niwa, Shelley. (1985). An Assessment of the Validity and Reliability of the Institutional Performance Survey.

Kristandl, Gerhard, & Bontis, Nick. (2007). Constructing a definition for intangibles using the resource based view of the firm. *Management Decision, 45*(9), 1510-1524.

Kujansivu, Paula, & Lönnqvist, Antti. (2007). Investigating the value and efficiency of intellectual capital. *Journal of Intellectual Capital, 8*(2), 272-287.

Kumar, Nirmalya. (1996). The power of trust in manufacturer-retailer relationships. *Harvard business review, 74*, 92-110.

Kusunoki, Ken, Nonaka, Ikujiro, & Nagata, Akiya. (1998). Organizational capabilities in product development of Japanese firms: a conceptual framework and empirical findings. *Organization Science, 9*(6), 699-718.

Lane, Christel, & Bachmann, Reinhard. (1998). *Trust within and between organizations: Conceptual issues and empirical applications*: Oxford University Press.

Lane, Peter J, Salk, Jane E, & Lyles, Marjorie A. (2001). Absorptive capacity, learning, and performance in international joint ventures. *Strategic management journal, 22*(12), 1139-1161.

Lawrence, Paul R, Lorsch, Jay W, & Garrison, James S. (1967). *Organization and environment: Managing differentiation and integration*: Division of Research, Graduate School of Business Administration, Harvard University Boston, MA.

Leadbeater, Charles. (2000). *New measures for the new economy*: Institute of Chartered Accountants in England & Wales.

Leana, Carrie R, & Van Buren, Harry J. (1999). Organizational social capital and employment practices. *Academy of management review, 24*(3), 538-555.

Leidner, Dorothy, Alavi, Maryam, & Kayworth, Timothy. (2008). The role of culture in knowledge management: a case study of two global firms. *Global information systems: The implications of culture for IS management*, 265-289.

Lev, Baruch. (2001). *Intangibles: Management, measurement, and reporting*: Brookings Inst Press.

Lev, Baruch, & Sougiannis, Theodore. (1996). The capitalization, amortization, and value-relevance of R&D. *Journal of accounting and economics, 21*(1), 107-138.

Lev, Baruch, & Zarowin, Paul. (1999). The boundaries of financial reporting and how to extend them. *Journal of Accounting Research, 37*(2), 353-385.

Lewis, Marianne W. (2000). Exploring paradox: Toward a more comprehensive guide. *Academy of Management Review, 25*(4), 760-776.

Libby, Theresa. (1999). The influence of voice and explanation on performance in a participative budgeting setting. *Accounting, Organizations and Society, 24*(2), 125-137.

Lin, Chieh-Peng. (2007). To share or not to share: Modeling tacit knowledge sharing, its mediators and antecedents. *Journal of business ethics, 70*(4), 411-428.

Lind, E Allan, Kanfer, Ruth, & Earley, P Christopher. (1990). Voice, control, and procedural justice: Instrumental and noninstrumental concerns in fairness judgments. *Journal of Personality and Social Psychology, 59*(5), 952.

Lipe, Marlys Gascho, & Salterio, Steven. (2002). A note on the judgmental effects of the balanced scorecard's information organization. *Accounting, Organizations and Society, 27*(6), 531-540.

Lipe, Marlys Gascho, & Salterio, Steven E. (2000). The balanced scorecard: Judgmental effects of common and unique performance measures. *The Accounting Review, 75*(3), 283-298.

Loehlin, John C. (2012). *Latent variable models: An introduction to factor, path, and structural equation analysis*: Psychology Press.

Louçã, Francisco, & Mendonça, Sandro. (2002). Steady change: the 200 largest US manufacturing firms throughout the 20th century. *Industrial and Corporate Change, 11*(4), 817-845.

Lu, Chin-Shan, Lai, Kee-hung, & Cheng, TCE. (2007). Application of structural equation modeling to evaluate the intention of shippers to use Internet services in liner shipping. *European Journal of Operational Research, 180*(2), 845-867.

Lusch, Robert F, & Laczniak, Gene R. (1987). The evolving marketing concept, competitive intensity and organizational performance. *Journal of the Academy of Marketing Science, 15*(3), 1-11.

Lynch, Richard L, & Cross, Kelvin F. (1995). *Measure up!: Yardsticks for continuous improvement*: Blackwell business Cambridge, MA.

Lynn, BE. (1999). Culture and intellectual capital management: a key factor in successful ICM implementation. *International Journal of Technology Management, 18*(5), 590-603.

Lynn, Bernadette E. (1998). Performance evaluation in the new economy: bringing the measurement and evaluation of intellectual capital into the management planning and control system. *International Journal of Technology Management, 16*(1), 162-176.

MacDuffie, John Paul. (2010). Inter-organizational trust and the dynamics of distrust. *Journal of International Business Studies, 42*(1), 35-47.

MacKinnon, David P, Fairchild, Amanda J, & Fritz, Matthew S. (2007). Mediation analysis. *Annual review of psychology, 58*, 593.

Malerba, Franco, & Orsenigo, Luigi. (2000). Knowledge, innovative activities and industrial evolution. *Industrial and corporate change, 9*(2), 289-314.

Malina, Mary A, & Selto, Frank H. (2001). Communicating and controlling strategy: An empirical study of the effectiveness of the balanced scorecard. *Journal of Management Accounting Research, 13*(1), 47-90.

Marginson, David EW. (2002). Management control systems and their effects on strategy formation at middle-management levels: evidence from a UK organization. *Strategic management journal, 23*(11), 1019-1031.

Marr, Bernard. (2012). *Perspectives on intellectual capital*: Routledge.

Marr, Bernard, Gray, Dina, & Neely, Andy. (2003). Why do firms measure their intellectual capital? *Journal of intellectual capital, 4*(4), 441-464.

Marr, Bernard, Schiuma, Giovanni, & Neely, Andy. (2004). The dynamics of value creation: mapping your intellectual performance drivers. *Journal of Intellectual Capital, 5*(2), 312-325.

Mathews, John A. (2003). Competitive dynamics and economic learning: an extended resource-based view. *Industrial and Corporate Change, 12*(1), 115-145.

Mayer, Roger C, Davis, James H, & Schoorman, F David. (1995). An integrative model of organizational trust. *Academy of management review*, 709-734.

McAllister, Daniel J. (1995). Affect-and cognition-based trust as foundations for interpersonal cooperation in organizations. *Academy of management journal*, 24-59.

McDermott, Richard, & O'Dell, Carla. (2001). Overcoming cultural barriers to sharing knowledge. *Journal of knowledge management, 5*(1), 76-85.

McEvily, Bill, Perrone, Vincenzo, & Zaheer, Akbar. (2003). Trust as an organizing principle. *Organization science, 14*(1), 91-103.

Mehralian, Gholamhossein, Rajabzadeh, Ali, Sadeh, Mohammad Reza, & Rasekh, Hamid Reza. (2012). Intellectual capital and corporate performance in Iranian pharmaceutical industry. *Journal of intellectual capital, 13*(1), 138-158.

Menor, Larry J, Kristal, M Murat, & Rosenzweig, Eve D. (2007). Examining the influence of operational intellectual capital on capabilities and performance. *Manufacturing & Service Operations Management, 9*(4), 559-578.

Merchant, Kenneth A, & Van der Stede, Wim A. (2007). *Management control systems: Performance measurement, evaluation and incentives*: Pearson Education.

Mia, Lokman. (1993). The role of MAS information in organisations: an empirical study. *The British Accounting Review, 25*(3), 269-285.

Mia, Lokman, & Clarke, Brian. (1999). Market competition, management accounting systems and business unit performance. *Management Accounting Research, 10*(2), 137-158.

Miles, Raymond E, & Snow, Charles C. (1984). Designing strategic human resources systems. *Organizational dynamics, 13*(1), 36-52.

Molnar, Michael J. (2004). Executive Views on Intangible Assets: Insights from the Accenture Economist Intelligence Unit Survey, Accenture Research Note Intangible Assets and Future Value.

Moorman, Christine, Deshpande, Rohit, & Zaltman, Gerald. (1993). Factors affecting trust in market research relationships. *The Journal of Marketing*, 81-101.

Morgan, Robert M, & Hunt, Shelby D. (1994). The commitment-trust theory of relationship marketing. *the journal of marketing*, 20-38.

Mouritsen, Jan. (1998). Driving growth: economic value added versus intellectual capital. *Management accounting research, 9*(4), 461-482.

Mouritsen, Jan. (2003). Intellectual capital and the capital market: the circulability of intellectual capital. *Accounting, Auditing & Accountability Journal, 16*(1), 18-30.

Mouritsen, Jan, Larsen, Heine T, & Bukh, Per Nikolaj. (2001). Valuing the future: intellectual capital supplements at Skandia. *Accounting, Auditing & Accountability Journal, 14*(4), 399-422.

Myers, Michael D. (1997). Qualitative research in information systems. *Management Information Systems Quarterly, 21*, 241-242.

Nahapiet, Janine, & Ghoshal, Sumantra. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of management review*, 242-266.

Namvar, Morteza, Fathian, Mohammad, Akhavan, Peyman, & Gholamian, Mohammad Reza. (2010). Exploring the impacts of intellectual property on intellectual capital and company performance: The case of Iranian computer and electronic organizations. *Management Decision, 48*(5), 676-697.

Nanni, Alfred J, Dixon, J Robb, & Vollmann, Thomas E. (1992). Integrated performance measurement: management accounting to support the new manufacturing realities. *Journal of Management Accounting Research, 4*(1), 1-19.

Narver, John C, & Slater, Stanley F. (1990). The effect of a market orientation on business profitability. *The Journal of Marketing*, 20-35.

Nazari, Jamal A, Herremans, Irene M, Isaac, Robert G, Manassian, Armond, & Kline, Theresa J. (2009). Organizational characteristics fostering intellectual capital in Canada and the Middle East. *Journal of Intellectual Capital, 10*(1), 135-148.

Neely, Andy. (1998). Three modes of measurement: theory and practice. *International Journal of Business Performance Management, 1*(1), 47-64.

Nelson, Richard R, & Winter, Sidney G. (1982). *An evolutionary theory of economic change*: Belknap press.

Neuman, William Lawrence. (2005). *Social research methods: Quantitative and qualitative approaches*: Allyn and Bacon.

Nicotera, Anne Maydan. (1995). *Conflict and organizations: Communicative processes*: SUNY Press.

Nonaka, Ikujiro. (1994). A dynamic theory of organizational knowledge creation. *Organization science, 5*(1), 14-37.

Nonaka, Ikujiro, & Takeuchi, Hirotaka. (1996). The knowledge-creating company: How Japanese companies create the dynamics of innovation. *Long Range Planning, 29*(4), 592.

Norreklit, Hanne. (2000). The balance on the balanced scorecard a critical analysis of some of its assumptions. *Management accounting research, 11*(1), 65-88.

Nunnally, Jum C. (2010). *Psychometric Theory 3E*: Tata McGraw-Hill Education.

O'Brien, Emma, Clifford, Seamus, & Southern, Mark. (2010). *Knowledge Management for Process, Organizational and Marketing Innovation: Tools and Methods*: Igi Publishing.

O'Hanlon, John, & Peasnell, Ken. (1998). Wall Street's contribution to management accounting: the Stern Stewart EVA< sup>®</sup> financial management system. *Management Accounting Research, 9*(4), 421-444.

O'REGAN, PHILIP, O'DONNELL, DAVID, Kennedy, Tom, Bontis, Nick, & Cleary, Peter. (2001). Perceptions of intellectual capital: Irish evidence. *Journal of Human Resource Costing & Accounting, 6*(2), 29-38.

O'Regan, Philip, O'Donnell, David, Kennedy, Tom, Bontis, Nick, & Cleary, Peter. (2005). Board composition, non-executive directors and governance cultures in Irish ICT firms: a CFO perspective. *Corporate Governance, 5*(4), 56-63.

O'Reilly, Charles A. (1989). *Corporations, culture, and commitment: Motivation and social control in organizations*: Produced and distributed by Center for Research in Management, University of California, Berkeley Business School.

Osterloh, Margit, & Frey, Bruno S. (2000). Motivation, knowledge transfer, and organizational forms. *Organization science, 11*(5), 538-550.

Otley, David. (1999). Performance management: a framework for management control systems research. *Management accounting research, 10*(4), 363-382.

Otley, David, Broadbent, Jane, & Berry, Anthony. (1995). Research in management control: an overview of its development. *British Journal of management, 6*(s1), S31-S44.

Otley, David T. (1980). The contingency theory of management accounting: achievement and prognosis. *Accounting, Organizations and Society, 5*(4), 413-428.

Ouchi, William G. (1979). A conceptual framework for the design of organizational control mechanisms. *Management science, 25*(9), 833-848.

Parker, Charles. (2000). Performance measurement. *Work study, 49*(2), 63-66.

Pascale, Richard, & Goss, Tracy. (1993). The reinvention roller coaster: risking the present for a powerful future. *Harvard Business Review, 71*(6), 97-106.

Perera, S, Harrison, G, & Poole, M. (1997). Customer-focused manufacturing strategy and the use of operations-based non-financial performance measures: a research note. *Accounting, Organizations and Society, 22*(6), 557-572.

Peters, Thomas J, & Waterman, Robert H. (1982). In search of excellence: Lessons from American's best-run companies. *New York: Harper& Row*.

Petrick, Joseph A, Scherer, Robert F, Brodzinski, James D, Quinn, John F, & Ainina, M Fall. (1999). Global leadership skills and reputational capital: Intangible resources for sustainable competitive advantage. *The Academy of Management Executive, 13*(1), 58-69.

Petty, Richard, & Guthrie, James. (2000). Intellectual capital literature review: measurement, reporting and management. *Journal of intellectual capital, 1*(2), 155-176.

Pike, Stephen, & Roos, Göran. (2004). Mathematics and modern business management. *Journal of Intellectual Capital, 5*(2), 243-256.

Pirson, Michael, & Malhotra, Deepak. (2008). Unconventional insights for managing stakeholder trust. *Harvard Business School NOM Working Paper*(08-057).

Pitkanen, A. (2007). Defining and Measuring Factors Explaining Firm's Intellectual Capital in Manufacturing and Information Technology Industries–A Contingency Approach. *Department of Accounting and Finance, Turku School of Economics, Turku*.

Podsakoff, Philip M, MacKenzie, Scott B, Lee, Jeong-Yeon, & Podsakoff, Nathan P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology, 88*(5), 879.

Polanyi, Michael, & Sen, Amartya. (1983). *The tacit dimension*: Peter Smith Gloucester, MA.

Porter, Michael. (1980). E.(1980). Competitive strategy. *New York*.

Powell, Thomas C, & Dent-Micallef, Anne. (1997). Information technology as competitive advantage: the role of human, business, and technology resources. *Strategic management journal, 18*(5), 375-405.

Pöyhönen, Aino, & Smedlund, Anssi. (2004). Assessing intellectual capital creation in regional clusters. *Journal of Intellectual Capital, 5*(3), 351-365.

Preacher, Kristopher J, & Hayes, Andrew F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior research methods, 40*(3), 879-891.

Prusak, Laurence, & Cohen, Don. (2001). How to invest in social capital. *Harvard Business Review, 79*(6), 86-97.

Pučėtaitė, Raminta, & Lämsä, Anna-Maija. (2008). Developing organizational trust through advancement of employees' work ethic in a post-socialist context. *Journal of business ethics, 82*(2), 325-337.

Putnam, Robert D. (1995). Tuning in, tuning out: The strange disappearance of social capital in America. *PS-WASHINGTON-, 28*, 664-664.

Quinn, Robert E. (1988). *Beyond rational management*: Jossey-Bass San Francisco.

Quinn, Robert E, & Kimberly, John R. (1984). Paradox, planning, and perseverance: Guidelines for managerial practice. *Managing organizational transitions, 2*(9), 5-3.

Quinn, Robert E, & McGrath, Michael R. (1985). The transformation of organizational cultures: A competing values perspective. *Organizational culture*, 315-334.

Quinn, Robert E, & Rohrbaugh, John. (1983). A spatial model of effectiveness criteria: towards a competing values approach to organizational analysis. *Management science, 29*(3), 363-377.

Ranger-Moore, James. (1997). Bigger may be better, but is older wiser? Organizational age and size in the New York life insurance industry. *American Sociological Review*, 903-920.

Reed, Kira Kristal. (2000). The dynamics of intellectual capital.

Reich, Robert B. (2010). *The Work of Nations: Preparing Ourselves for 21st Century Capitalis*: Random House Digital, Inc.

Richard, Pierre J, Devinney, Timothy M, Yip, George S, & Johnson, Gerry. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of management, 35*(3), 718-804.

Richardson, John G. (1986). *Handbook of Theory and Research for the Sociology of Education*: Greenwood Publishing Group.

Ringle, Christian M, Wende, Sven, & Will, Alexander. (2005). SmartPLS 2.0 (beta): Hamburg, Germany.

Robinson, George, & Kleiner, Brian H. (1996). How to measure an organization's intellectual capital. *Managerial Auditing Journal, 11*(8), 36-39.

Rolland, N, & Chauvel, D. (2000). Knowledge transfer in strategic alliances. *Knowledge horizons: The present and the promise of knowledge management*, 225-236.

Roos, Göran, Pike, Stephen, & Fernstrom, Lisa. (2012). *Managing intellectual capital in practice*: Routledge.

Roos, Göran, & Roos, Johan. (1997). Measuring your company's intellectual performance. *Long range planning, 30*(3), 413-426.

Roos, Johan, Roos, Göran, Dragonetti, Nicola Carlo, & Edvinsson, Leif. (1997). *Intellectual capital*: Macmillan Business Basingstoke.

Roos, Johan, & Whitehill, M. (1998). Exploring the concept of intellectual capital (IC). *Long Range Planning, 31*(1), 150-153.

Roslender, Robin, & Fincham, Robin. (2001). Thinking critically about intellectual capital accounting. *Accounting, Auditing & Accountability Journal, 14*(4), 383-399.

Rotch, William. (1993). Management Control Systems: One View of Components and Their Interdependence1. *British Journal of Management, 4*(3), 191-203.

Rothaermel, Frank T, & Hess, Andrew M. (2007). Building dynamic capabilities: Innovation driven by individual-, firm-, and network-level effects. *Organization Science, 18*(6), 898-921.

Rouse, Michael J, & Daellenbach, Urs S. (2002). More thinking on research methods for the resource-based perspective. *Strategic management journal, 23*(10), 963-967.

Rousseau, Denise M, Sitkin, Sim B, Burt, Ronald S, & Camerer, Colin. (1998). Not so different after all: A cross-discipline view of trust. *Academy of management review, 23*(3), 393-404.

Rowley, Jennifer, & Slack, Frances. (2004). Conducting a literature review. *Management Research News, 27*(6), 31-39.

Rumelt, Richard P. (1997). Towards a strategic theory of the firm. *Resources, firms, and strategies: A reader in the resource-based perspective*, 131-145.

Sackmann, Sonja A, Flamholtz, Eric G, & Bullen, Maria L. (1989). Human resource accounting: a state-of-the-art review. *Journal of Accounting Literature, 8*(s 235), 264.

Said, Amal A, HassabElnaby, Hassan R, & Wier, Benson. (2003). An empirical investigation of the performance consequences of nonfinancial measures. *Journal of Management Accounting Research, 15*(1), 193-223.

Sánchez-Cañizares, Sandra M, Munoz, Miguel Angel Ayuso, & López-Guzmán, Tomás. (2007). Organizational culture and intellectual capital: a new model. *Journal of intellectual capital, 8*(3), 409-430.

Saunders, Mark NK, Saunders, Mark, Lewis, Philip, & Thornhill, Adrian. (2011). *Research Methods For Business Students, 5/e*: Pearson Education India.

Schein, Edgar H. (2006). *Organizational culture and leadership* (Vol. 356): Jossey-bass.

Schiemann, William, & Lingle, John H. (1999). *Bullseye!: hitting your strategic targets through high-impact measurement*: SimonandSchuster. com.

Schreyögg, Georg, & Steinmann, Horst. (1987). Strategic control: a new perspective. *Academy of Management Review, 12*(1), 91-103.

Schultz, Theodore W. (1961). Investment in human capital. *The American economic review, 51*(1), 1-17.

Schurr, Paul H, & Ozanne, Julie L. (1985). Influences on exchange processes: buyers' preconceptions of a seller's trustworthiness and bargaining toughness. *Journal of Consumer Research*, 939-953.

Scott, Thomas W, & Tiessen, Peter. (1999). Performance measurement and managerial teams. *Accounting, Organizations and society, 24*(3), 263-285.

Sekaran, U, & Bougie, R. (2010). Research methods for business: A skill building approach. Wiley: London.

Sekaran, Uma. (2006). *Research methods for business*: John Wiley & Sons.

Seleim, Ahmed, Ashour, Ahmed, & Bontis, Nick. (2004). Intellectual capital in Egyptian software firms. *Learning Organization, The, 11*(4/5), 332-346.

Seleim, Ahmed, Ashour, Ahmed, & Bontis, Nick. (2007). Human capital and organizational performance: a study of Egyptian software companies. *Management Decision, 45*(4), 789-801.

Selto, Frank H, Renner, Celia J, & Young, S Mark. (1995). Assessing the organizational fit of a just-in-time manufacturing system: testing selection, interaction and systems models of contingency theory. *Accounting, Organizations and Society, 20*(7), 665-684.

Sharabati, Abdel-Aziz Ahmad, Jawad, Shawqi Naji, & Bontis, Nick. (2010). Intellectual capital and business performance in the pharmaceutical sector of Jordan. *Management Decision, 48*(1), 105-131.

Shields, Michael D. (1997). Research in management accounting by North Americans in the 1990s. *Journal of Management Accounting Research*(9), 3-61.

Shockley-Zalabak, Pamela, Ellis, Kathleen, & Winograd, Gaynelle. (2000). Organizational trust: What it means, why it matters. *Organization Development Journal, 18*(4), 35-48.

Shrout, Patrick E, & Bolger, Niall. (2002). Mediation in experimental and nonexperimental studies: new procedures and recommendations. *Psychological methods, 7*(4), 422.

Siegel, Lawrence R. (2004). *Measuring and managing intellectual capital in the US aerospace industry.* Massachusetts Institute of Technology.

Sim, Khim, & Killough, Larry. (1998). The performance effects of complementarities between manufacturing practices and management accounting systems. *Journal of Management Accounting Research*.

Simon, Herbert A, Guetzkow, Harold, Kozmetsky, George, & Tyndall, Gordon. (1954). Centralization vs. *Decentralization in Organizing the Controller's Department*, 49-50.

Simons, Robert. (1987). Accounting control systems and business strategy: an empirical analysis. *Accounting, Organizations and Society, 12*(4), 357-374.

Simons, Robert. (1990). The role of management control systems in creating competitive advantage: new perspectives. *Accounting, Organizations and Society, 15*(1), 127-143.

Simons, Robert. (1994a). How new top managers use control systems as levers of strategic renewal. *Strategic management journal, 15*(3), 169-189.

Simons, Robert. (1994b). *Levers of control: how managers use innovative control systems to drive strategic renewal*: Harvard Business Press.

Simons, Robert, Dávila, Antonio, & Kaplan, Robert S. (2000). *Performance measurement & control systems for implementing strategy: text & cases*: Prentice Hall Upper Saddle River, NJ.

Speklé, Roland F. (2001). Explaining management control structure variety: a transaction cost economics perspective. *Accounting, Organizations and Society, 26*(4), 419-441.

Spender, John-Christopher. (1996). Making knowledge the basis of a dynamic theory of the firm. *Strategic management journal, 17*, 45-62.

Ståhle, Pirjo, & Hong, Jianzhong. (2002). Dynamic intellectual capital in global rapidly changing industries. *Journal of Knowledge Management, 6*(2), 177-189.

Stam, Wouter, Arzlanian, Souren, & Elfring, Tom. (2013). Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing*.

Stede, Wim A Van der, Chow, Chee W, & Lin, Thomas W. (2006). Strategy, choice of performance measures, and performance. *Behavioral Research in Accounting, 18*(1), 185-205.

Steers, Richard M. (1977). Antecedents and outcomes of organizational commitment. *Administrative science quarterly*, 46-56.

Steinfield, Charles, Scupola, Ada, & López-Nicolás, Carolina. (2010). Social capital, ICT use and company performance: Findings from the Medicon Valley Biotech Cluster. *Technological Forecasting and Social Change, 77*(7), 1156-1166.

Stewart, Thomas, & Ruckdeschel, Clare. (1998). Intellectual capital: The new wealth of organizations. *Performance Improvement, 37*(7), 56-59.

Stovel, Meaghan, & Bontis, Nick. (2002). Voluntary turnover: knowledge management–friend or foe? *Journal of intellectual Capital, 3*(3), 303-322.

Subramaniam, Mohan, & Youndt, Mark A. (2005). The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal, 48*(3), 450-463.

Sullivan, Patrick H. (1999). Profiting from intellectual capital. *Journal of Knowledge Management, 3*(2), 132-143.

Sullivan, Patrick H. (2000). *Value driven intellectual capital: how to convert intangible corporate assets into market value*: John Wiley & Sons, Inc.

Sveiby, Karl-Erick. (2002). Measuring intangibles and intellectual capital. *Knowledge Management, 2002*, 337-354.

Sveiby, Karl-Erik. (2001). A knowledge-based theory of the firm to guide in strategy formulation. *Journal of intellectual capital, 2*(4), 344-358.

Sveiby, Karl Erik. (1997). *The new organizational wealth: Managing and measuring knowledge-based assets*: Berrett-Koehler Publishers.

Sydow, Jörg. (1998). Understanding the constitution of interorganizational trust. *Trust within and between organizations: Conceptual issues and empirical applications*, 31-63.

Szulanski, Gabriel. (2000). The process of knowledge transfer: A diachronic analysis of stickiness. *Organizational behavior and human decision processes, 82*(1), 9-27.

Tayles, Mike, Bramley, Andrew, Adshead, Neil, & Farr, Janet. (2002). Dealing with the management of intellectual capital: the potential role of strategic management accounting. *Accounting, Auditing & Accountability Journal, 15*(2), 251-267.

Tayles, Mike, Pike, Richard H, & Sofian, Saudah. (2007). Intellectual capital, management accounting practices and corporate performance: perceptions of managers. *Accounting, Auditing & Accountability Journal, 20*(4), 522-548.

Teece, David J. (1998). Research directions for knowledge management. *California management review, 40*(3), 289.

Teece, David J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal, 28*(13), 1319-1350.

Teo, Hock-Hai, Wei, Kwok Kee, & Benbasat, Izak. (2003). Predicting intention to adopt interorganizational linkages: an institutional perspective. *Mis Quarterly*, 19-49.

Thompson, James David, Scott, W Richard, & Zald, Mayer N. (2009). *Organizations in action: Social science bases of administrative theory*: Transaction Books.

Tjosvold, Dean. (1997). Conflict within interdependence: Its value for productivity and individuality. *Using conflict in organizations*, 23-37.

Trevinyo-Rodríguez, Rosa Nelly, & Bontis, Nick. (2007). The role of intellectual capital in Mexican family-based businesses: understanding their soul, brain and heart. *Journal of Information & Knowledge Management, 6*(03), 189-200.

Tsai, Wenpin, & Ghoshal, Sumantra. (1998). Social capital and value creation: The role of intrafirm networks. *Academy of management Journal*, 464-476.

Turner, Karynne L, & Makhija, Mona V. (2006). THE ROLE OF ORGANIZATIONAL CONTROLS IN MANAGING KNOWLEDGE. *Academy of Management Review, 31*(1), 197-217.

Ulrich, Dave. (1998). Intellectual capital= competence x commitment. *Sloan Management Review, 39*(2), 15-26.

Usoff, Catherine A, Thibodeau, Jay C, & Burnaby, Priscilla. (2002). The importance of intellectual capital and its effect on performance measurement systems. *Managerial Auditing Journal, 17*(1/2), 9-15.

Uttal, Bro. (1983). The corporate culture vultures. *Fortune, 17*, 66-72.

Van de Ven, Andrew H. (1986). Central problems in the management of innovation. *Management science, 32*(5), 590-607.

Van der Meer-Kooistra, Jeltje, & Zijlstra, Siebren M. (2001). Reporting on intellectual capital. *Accounting, Auditing & Accountability Journal, 14*(4), 456-476.

Van Slyke, EJ. (1999). Resolve conflict, boost creativity. *HR MAGAZINE, 44*(12), 132-137.

Vandenbosch, Betty. (1999). An empirical analysis of the association between the use of executive support systems and perceived organizational competitiveness. *Accounting, Organizations and Society, 24*(1), 77-92.

Venkatraman, Natarjan, & Ramanujam, Vasudevan. (1986). Measurement of business performance in strategy research: a comparison of approaches. *Academy of management review, 11*(4), 801-814.

Venkatraman, Nenkat. (1989). The concept of fit in strategy research: toward verbal and statistical correspondence. *Academy of management review, 14*(3), 423-444.

Venkatraman, Nenkat, & Prescott, John E. (1990). Environment-strategy coalignment: An empirical test of its performance implications. *Strategic Management Journal, 11*(1), 1-23.

von der Heidt, Tania, & Scott, Don R. (2007). Partial aggregation for complex structural equation modelling (SEM) and small sample sizes: an illustration using a multi-stakeholder model of cooperative interorganisational relationships (IORs) in product innovation'.

Wall, Toby D, Michie, Jonathan, Patterson, Malcolm, Wood, Stephen J, Sheehan, Maura, Clegg, Chris W, & West, Michael. (2004). On the validity of subjective measures of company performance. *Personnel psychology, 57*(1), 95-118.

Walsh, Vivien, Roy, Robin, Bruce, Margaret, & Potter, Stephen. (1992). *Winning by design: technology, product design and international competitiveness*: Blackwell Publishers.

Wang, Wen-Ying, & Chang, Chingfu. (2005). Intellectual capital and performance in causal models: evidence from the information technology industry in Taiwan. *Journal of Intellectual Capital, 6*(2), 222-236.

Wernerfelt, Birger. (1984). A resource-based view of the firm. *Strategic management journal, 5*(2), 171-180.

Weston, Marla J, Estrada, Nicolette A, & Carrington, Jane. (2007). Reaping benefits from intellectual capital. *Nursing administration quarterly, 31*(1), 6-12.

Widener, Sally K. (2006). Associations between strategic resource importance and performance measure use: The impact on firm performance. *Management Accounting Research, 17*(4), 433-457.

Wiig, Karl M. (1997). Integrating intellectual capital and knowledge management. *Long range planning, 30*(3), 399-405.

Wiklund, Johan, & Shepherd, Dean. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strategic management journal, 24*(13), 1307-1314.

Williams, Jason, & MacKinnon, David P. (2008). Resampling and distribution of the product methods for testing indirect effects in complex models. *Structural Equation Modeling, 15*(1), 23-51.

Wixom, Barbara H, & Watson, Hugh J. (2001). An empirical investigation of the factors affecting data warehousing success. *MIS quarterly, 25*(1), 17-32.

Woodward, Joan, Dawson, Sandra, & Wedderburn, Dorothy. (1965). *Industrial organization: Theory and practice* (Vol. 3): Oxford University Press London.

Wouters, Marc, Kokke, Kees, Theeuwes, Jacques, & Van Donselaar, Karel. (1999). Identification of critical operational performance measures—a research note on a benchmarking study in the transportation and distribution sector. *Management Accounting Research, 10*(4), 439-452.

Wyatt, Anne. (2005). Accounting recognition of intangible assets: theory and evidence on economic determinants. *The accounting review, 80*(3), 967-1003.

Wyatt, Anne. (2008). What financial and non-financial information on intangibles is value-relevant? A review of the evidence. *Accounting and Business Research, 38*(3), 217-256.

Yauch, Charlene A, & Steudel, Harold J. (2003). Complementary use of qualitative and quantitative cultural assessment methods. *Organizational Research Methods, 6*(4), 465-481.

Yeganeh, Hamid, & Su, Zhan. (2008). An examination of human resource management practices in Iranian public sector. *Personnel Review, 37*(2), 203-221.

Youndt, Mark A, & Snell, Scott A. (2004). Human resource configurations, intellectual capital, and organizational performance. *Journal of Managerial Issues*, 337-360.

Youndt, Mark A, Subramaniam, Mohan, & Snell, Scott A. (2004). Intellectual Capital Profiles: An Examination of Investments and Returns*. *Journal of Management Studies, 41*(2), 335-361.

Young, Greg, Sapienza, Harry, & Baumer, David. (2003). The influence of flexibility in buyer–seller relationships on the productivity of knowledge. *Journal of Business Research, 56*(6), 443-451.

Yu, Zhu, & Yanfei, Wang. (2008). *Intellectual Capital in the Process of Organizational Culture to Firm Performance.* Paper presented at the Wireless Communications, Networking and Mobile Computing, 2008. WiCOM'08. 4th International Conference on.

Yusoff, Wan Fadzilah Wan, Jantan, Muhamad, Nasurdin, Aizzat Mohd, Fadzil, Nur Fitriah Ahmed, Fadzil, Mohammad Ikram Ahmed, Fontaine, Gary, . . . Lasky, Barbara. (2003). Intellectual Capital and Firm Performance: The Moderating Effects of Environment and Strategy.

Zack, Michael H. (1999). Managing codified knowledge. *Sloan management review, 40*(4), 45-58.

Zaheer, Akbar, McEvily, Bill, & Perrone, Vincenzo. (1998). Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance. *Organization science, 9*(2), 141-159.

Zammuto, Raymond F, & Krakower, Jack Y. (1991). *Quantitative and qualitative studies of organizational culture*: JAI Press Inc.

Zander, Udo, & Kogut, Bruce. (1995). Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organization science, 6*(1), 76-92.

Zhao, Xinshu, Lynch, John G, & Chen, Qimei. (2010). Reconsidering Baron and Kenny: Myths and truths about mediation analysis. *Journal of Consumer Research, 37*(2), 197-206.

Zhou, Albert Z, & Fink, Dieter. (2003). The intellectual capital web: a systematic linking of intellectual capital and knowledge management. *Journal of intellectual capital, 4*(1), 34-48.

Zikmund, WG. (2003). Business research methods 7th ed., Thomson/South-Western: Appendices.

Zimmerman, Barry J. (1995). Self-regulation involves more than metacognition: A social cognitive perspective. *Educational psychologist, 30*(4), 217-221.

CIMA (2001), "Managing the intellectual capital within today's knowledge-based organisations", *Technical Briefing, CIMA, London*.

Kaplan, R. S., & Norton, D. P. (1992). The balanced scorecard—Measures that drive performance. *Harvard Business Review*(January–February), 71–79.

Sarantakos, S. (1998). Social research (2nd ed.). *London: Macmillan*

APENDIX (A)

APPENDIX (A)

- **COPY OF THE COVERING LTTERS**
- **COPY OF THE QUESTIONNAIRE**
- **IRANIAN VERSION OF THE QUESTIONNAIRE**

A DOCTORAL SURVEY ON INTELLECTUAL CAPITAL AND PERFORMANCE MEASUREMENT SYSTEM

KAVEH ASIAEI
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And

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YEAR 2012

LINKING INTELLECTUAL CAPITAL TO MANAGEMENT ACCOUNTING AND ORGANISATIONAL PERFORMANCE

Dear Sir / Madam,

With the evolution of the 'Information Age', intellectual capital (IC) - (a form of intangible assets) - enables organizations to gain and maintain sustainable competitive advantage. This study aims to explore the nature of IC and investigate its implications for one of the most dominant elements of management accounting known as performance measurement system (PMS) as well as its impact on organizational performance. So, this questionnaire seeks to capture the forms, importance and implications of IC and PMS in your organization.

IC is defined as 'the possession of knowledge, applied experience, organizational technology, customer relationships and professional skill that provides companies with a competitive edge in the market'. IC is "knowledge that can be converted into profits". In this research, IC can be divided into human capital, structural capital, relational capital, and social capital. Human Capital is the tacit knowledge embedded in the minds of the employees; Structural Capital refers to the organizational procedures and routines of the business; Relational Capital embraces the knowledge of market channels, customer and supplier relationships, as well as a sound understanding of governmental or industry associations, and finally Social Capital is the knowledge stemmed from informal interactions among the employees within an organization.

As the company's CFO / finance director, please try to act as your organization's representative in answering this questionnaire. The study concentrates on the organization not the individual. Please complete all items in the questionnaire. All the information you provide will be strictly confidential *and* will not be accessible to anyone else. Your responses will only be reported in aggregate form and no single firm's results will be presented. The questionnaire should take about 10-15 minutes to complete. Your participation in this research study will be much appreciated. Please return the questionnaire within the next 2-3 weeks. If you have any questions or concerns, please do not hesitate to contact me at kave_asia@yahoo.com / on one of the following numbers: Malaysia: +60149314043; Iran: +985118644477.

Sincerely yours,
Kaveh Asiaei,
PhD Candidate in Accounting,
Accounting Department,
Faculty of Business & Accountancy,
Universiti Malaya, 50603 Kuala Lumpur, MALAYSIA
CC: Prof. Dr. Ruzita Jusoh (Research Supervisor)

SECTION A: Intellectual Capital (IC)

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The following items explore aspects of intellectual capital. Please rate (by ticking the box provided) to what extent do you agree with the following items describing your organization's intellectual capital?
Please use 4 sparingly.
(1=strongly disagree; 7 =strongly agree).

(1) Strongly disagree	(2) Quite disagree	(3) Slightly disagree	(4) Neither disagree nor agree	(5) Slightly agree	(6) Quite agree	(7) Strongly agree

No		(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	Our organization selects managers and staff according to their brightness and creativity.	☐	☐	☐	☐	☐	☐	☐
2	Our organization gets the most out of the managers and staff.	☐	☐	☐	☐	☐	☐	☐
3	Our organization requires knowledge sharing among managers and staff.	☐	☐	☐	☐	☐	☐	☐
4	Our managers and staff are generally experts in their particular jobs and functions.	☐	☐	☐	☐	☐	☐	☐
5	Our managers and staff are generally able to develop new ideas and knowledge.	☐	☐	☐	☐	☐	☐	☐
6	Our managers and staff are generally able to focus on the quality of service provided.							
7	Our organization's data systems make it easy to access relevant information.	☐	☐	☐	☐	☐	☐	☐
8	Our organization's systems and procedures support innovation.	☐	☐	☐	☐	☐	☐	☐
9	Our organization requires knowledge sharing and encourages learning.	☐	☐	☐	☐	☐	☐	☐
10	Our organization has relatively high investment in innovation.	☐	☐	☐	☐	☐	☐	☐
11	Our organization keeps track and makes full use of our intellectual assets such as patents and copyrights.	☐	☐	☐	☐	☐	☐	☐
12	Our organization has a high rate of generation of new ideas and products compared to our competitors.	☐	☐	☐	☐	☐	☐	☐
13	Our organization provides a sufficiently high annual information technology allocation (for	☐	☐	☐	☐	☐	☐	☐

	personnel, hardware, software, etc.) to allow us to provide quality service.							
14	Our organization documents knowledge in manuals, databases, etc.	☐	☐	☐	☐	☐	☐	☐
15	Our organization protects vital knowledge and information to prevent loss in the event of key people leaving the organization.	☐	☐	☐	☐	☐	☐	☐
16	Our organization has customers loyal to our organization / product.	☐	☐	☐	☐	☐	☐	☐
17	Our organization is market-oriented / customer-focused.	☐	☐	☐	☐	☐	☐	☐
18	Our organization is efficient in satisfying customer's needs and requirements	☐	☐	☐	☐	☐	☐	☐
19	Our organization has most managers and employees who generally understand the organization's targeted market segments and customer profiles.	☐	☐	☐	☐	☐	☐	☐
20	Our organization gets as much feedback from our customers as we can.	☐	☐	☐	☐	☐	☐	☐
21	Our organization has marketing managers and staff who continually meet with customers to find out what they want from the organization.	☐	☐	☐	☐	☐	☐	☐
22	Our organization listens and responds to / manages customer complaints.	☐	☐	☐	☐	☐	☐	☐
23	Our organization has good relationships with its suppliers.	☐	☐	☐	☐	☐	☐	☐
24	Our organization devotes considerable time to vetting and approving suppliers.	☐	☐	☐	☐	☐	☐	☐
25	Our organization maintains long-standing relationships with a number of important suppliers	☐	☐	☐	☐	☐	☐	☐
26	Our employees are skilled at collaborating with each other to diagnose and solve problems.	☐	☐	☐	☐	☐	☐	☐
27	Our employees share information and learn from one another.	☐	☐	☐	☐	☐	☐	☐
28	Our employees interact and exchange ideas with people from different areas of the company.	☐	☐	☐	☐	☐	☐	☐
29	Our employees apply knowledge from one area of the company to problems and opportunities that arise in another.	☐	☐	☐	☐	☐	☐	☐

SECTION B: Performance Measurement System

B1. The following items explore aspects of Performance Measurement System in terms of the type of measures. Please rate (by ticking the box provided) the extent to which each of the following measures is used by your top management team
(1 = not at all; 7 = to a very great extent)

(1) Not at all	(2) To a Very Small Extent	(3) To a Small Extent	(4) To a moderate extent	(5) To a fairly great extent	(6) To a great extent	(7) To a very great extent

No	**Financial Measures**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
1	Operating income	☐	☐	☐	☐	☐	☐	☐
2	Sales growth	☐	☐	☐	☐	☐	☐	☐
3	Return-on-investment (ROI)	☐	☐	☐	☐	☐	☐	☐
4	Return-on-equity (ROE)	☐	☐	☐	☐	☐	☐	☐
5	Net cash flows	☐	☐	☐	☐	☐	☐	☐
6	Costs per unit produced	☐	☐	☐	☐	☐	☐	☐

No	**Customer Measures**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
7	Market share	☐	☐	☐	☐	☐	☐	☐
8	Customer response time	☐	☐	☐	☐	☐	☐	☐
9	On-time delivery	☐	☐	☐	☐	☐	☐	☐
10	Number of customer complaints	☐	☐	☐	☐	☐	☐	☐
11	Number of warranty claims	☐	☐	☐	☐	☐	☐	☐
12	Survey of customer satisfaction	☐	☐	☐	☐	☐	☐	☐

No	Internal Business Processes Measures	(1)	(2)	(3)	(4)	(5)	(6)	(7)
13	Materials efficiency variance	□	□	□	□	□	□	□
14	Manufacturing lead time	□	□	□	□	□	□	□
15	Rate of material scrap loss	□	□	□	□	□	□	□
16	Labour efficiency variance	□	□	□	□	□	□	□

No	Innovation and Learning Measures	(1)	(2)	(3)	(4)	(5)	(6)	(7)
17	Number of new patents	□	□	□	□	□	□	□
18	Number of new product launches	□	□	□	□	□	□	□
19	Time-to-market for new products	□	□	□	□	□	□	□
20	Employee satisfaction	□	□	□	□	□	□	□

No	Social and Environmental Measures	(1)	(2)	(3)	(4)	(5)	(6)	(7)
21	Employee diversity	□	□	□	□	□	□	□
22	Economic impacts (excluding financial measures used in financial accounts)	□	□	□	□	□	□	□
23	Occupational health and safety	□	□	□	□	□	□	□
24	Stakeholder involvement in community, social and environmental issues	□	□	□	□	□	□	□
25	Community relations	□	□	□	□	□	□	□
26	Natural resource conservation and emission levels	□	□	□	□	□	□	□
27	Other community, ethical, social and environmental issues	□	□	□	□	□	□	□

B2. The following items explore aspects of Performance Measurement System in terms of the balanced use of PMS. Please rate (by ticking the box provided) the extent to which your top management team currently uses performance measures to:
(Scale: 1=not at all to 7=to a great extent)

(1) Not at all	(2) To a Very Small Extent	(3) To a Small Extent	(4) To a moderate extent	(5) To a fairly great extent	(6) To a great extent	(7) To a very great extent

No	**Diagnostic PMS Use**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
1	Track progress towards goals	☐	☐	☐	☐	☐	☐	☐
2	Monitor results	☐	☐	☐	☐	☐	☐	☐
3	Compare outcomes to expectations	☐	☐	☐	☐	☐	☐	☐
4	Review key measures	☐	☐	☐	☐	☐	☐	☐
No	**Interactive PMS Use**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
5	Enable discussion in meetings of superiors, subordinates and peers.	☐	☐	☐	☐	☐	☐	☐
6	Enable continual challenge and debate underlying data, assumptions and action plans.	☐	☐	☐	☐	☐	☐	☐
7	Provide a common view of the organization.	☐	☐	☐	☐	☐	☐	☐
8	Tie the organization together.	☐	☐	☐	☐	☐	☐	☐
9	Enable the organization to focus on common issues.	☐	☐	☐	☐	☐	☐	☐
10	Enable the organization to focus on critical success factors.	☐	☐	☐	☐	☐	☐	☐
11	Develop a common vocabulary in the organization	☐	☐	☐	☐	☐	☐	☐

SECTION C: Organizational Culture

These questions relate to the type of organizations that your firm most resembles. Each of these items contains four descriptions of firms. Please distribute 100 points among the four descriptions depending on how similar the description is to your business. None of the descriptions is any better than the others; they are just different. Most businesses will be some mixture of those described. For example: In question 1, if the organization A seems very similar to yours, B seems somewhat similar, and C and D do not seem similar at all, you might give 70 points to A and the remaining 30 points to B.

1––Institutional characteristics (please distribute 100 points)

Description	Point
Organization A is a very personal place. It is like an extended family. People see to share a lot of themselves.	
Organization B is very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks.	
Organization C is very formalized and structured place. Bureaucratic procedures generally govern what people do.	
Organization D is a very production oriented. A major concern is with getting the job done. People are not very personally involved.	
total	**100**

2—Institutional leader (please distribute 100 points)

Description	Point
The head of Organization A is generally considered to be a mentor, a sage, or a father or mother figure.	
The head of Organization B is generally considered to be an entrepreneur, an innovator, or a risk taker.	
The head of Organization C is generally considered to be a coordinator, an organizer, or an administrator.	
The head of Organization D is generally considered to be a producer, a technician, or a hard-driver.	
total	**100**

3—Institutional cohesion (please distribute 100 points)

Description	Point
The glue that holds Organization A together is loyalty and tradition. Commitment to this organization runs high.	
The glue that holds Organization B together is commitment to innovation and development. There is an emphasis on being first.	
The glue that holds Organization C together is formal rules and policies. Maintaining a smooth-running organization is important here.	
The glue that holds Organization D together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.	
total	**100**

4—Institutional emphases (please distribute 100 points)

Description	Point
Organization A emphasizes human resources. High cohesion and morale in the organization are important.	
Organization B emphasizes growth and acquiring new resources. Readiness to	

meet new challenges is important.	
Organization C emphasizes permanence and stability. Efficient, smooth operations are important.	
Organization D emphasizes competitive actions and achievement. Measurable goals are important.	
total	**100**

SECTION D: Trust

The following items explore aspects of trust. Please rate (by ticking the box provided) to what extent do you agree with the following items which determine your organization's trust level?
Please use 4 sparingly.
(1=strongly disagree; 7 =strongly agree).

(1) Strongly disagree	(2) Quite disagree	(3) Slightly disagree	(4) Neither disagree nor agree	(5) Slightly agree	(6) Quite agree	(7) Strongly agree

No		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
1	There is a very high level of trust throughout this organization.	☐	☐	☐	☐	☐	☐	☐
2	In this organization, subordinates have a great deal of trust for managers.	☐	☐	☐	☐	☐	☐	☐
3	If someone in this organization makes a promise, others within the organization will almost always trust that the person will do his or her best to keep the promise.	☐	☐	☐	☐	☐	☐	☐
4	Managers in this company trust their subordinates to make good decisions.	☐	☐	☐	☐	☐	☐	☐
5	When this organization enters into a partnership with another organization, it usually has a great deal of trust that the other organization will work in the best interest of the partnership.	☐	☐	☐	☐	☐	☐	☐
6	Once this organization establishes a business relationship with another organization, it remains very loyal to that relationship and works hard to ensure that the relationship remains strong for a long time.	☐	☐	☐	☐	☐	☐	☐
7	This organization trusts that our suppliers are being honest with us.	☐	☐	☐	☐	☐	☐	☐
8	This organization trusts that our customers are being honest with us.	☐	☐	☐	☐	☐	☐	☐

SECTION E: Performance

Please respond (by ticking the box provided) the following items with regard to your perception about your organization's recent performance (last three years) relative to key competitors' in the industry.
***(1* = significantly below average";** ***7* = and "significantly above average)**

(1) Significantly below average	(2) Quite below average	(3) Slightly below average	(4) Average	(5) Slightly above average	(6) Quite above average	(7) Significantly above average

No		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
1	Return on investment	☐	☐	☐	☐	☐	☐	☐
2	Profit	☐	☐	☐	☐	☐	☐	☐
3	Cash flow from operations	☐	☐	☐	☐	☐	☐	☐
4	Cost control	☐	☐	☐	☐	☐	☐	☐
5	Development of new products	☐	☐	☐	☐	☐	☐	☐
6	Sales volume	☐	☐	☐	☐	☐	☐	☐
7	Market share	☐	☐	☐	☐	☐	☐	☐
8	Market developments	☐	☐	☐	☐	☐	☐	☐
9	Personnel developments	☐	☐	☐	☐	☐	☐	☐
10	Political-public affairs	☐	☐	☐	☐	☐	☐	☐

SECTION F: General Information

I would be most grateful if you would kindly fill in the following personal details that will help with future communication and the analysis of the survey results. Please at least fill in these *** (Questions number 5, 6, 7). Neither you nor your organization will be identified subsequently.

1. Gender: (Please tick (/)) [ ] Male [ ] Female

2. Your highest level of education achieved: (Please tick (/))

   [ ] Diploma [ ] Degree [ ] Masters [ ] PhD

3. What is your age range? (Please tick (/))

   [ ] Below 20 years
   [ ] 20 years – 29 years
   [ ] 30 years – 39 years
   [ ] 40 years – 49 years
   [ ] More than 50 years

4. Number of years worked in this organization: (Please tick (/))

   [ ] less than 1
   [ ] 1 – 2
   [ ] 3 – 5
   [ ] 6 – 10
   [ ] over 10

*** 5. Your organization's type of business: (Please tick (/)) [ ] Manufacturing

[ ] Service Other (Please specify): [ ]

*** 6. The total number of employees in your organization: (Please tick (/))

[ ] Less than 100
[ ] 100 – 200
[ ] 201 – 400
[ ] 401 – 600
[ ] More than 600

*** 7. Your current organization's sales / turnover (Based on Billion Riyals): (Please tick (/))

[ ] Less than 1000
[ ] 1001 – 2000

[ ] 2001 – 4000
[ ] 4001 – 8000
[ ] 8001 – 16000
[ ] 16001 – 32000
[ ] More than 32000

8. Name and address of your organization:
_____

_____

9. Your organization's telephone number:
_____

10. Your name: (in capital letters, please)
_____

11. Your department: _____

12. Your position: _____

13. Your telephone number: _____

14. Your e-mail address: _____

15. Would you like to have a copy of the findings of the study? (Please tick (/))

[ ] Yes [ ] No

16. Do you have any comments on this questionnaire? If yes, please specify in the space provided. Your opinion is very important to me.

Thank you very much for your participation in this survey.

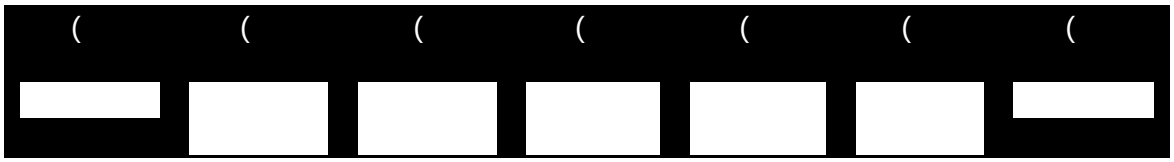
❖ IRANIAN VERSION OF THE QUESTIONNAIRE

ارتباط بین سرمایه فکری با حسابداری مدیریت و عملکرد سازمانی

جناب اقای

قسمت اول: سرمایه فکری

از سرمایه فکری میپردازد. لطفا با تیک زدن در جاهای تعیین شده ارزیابی

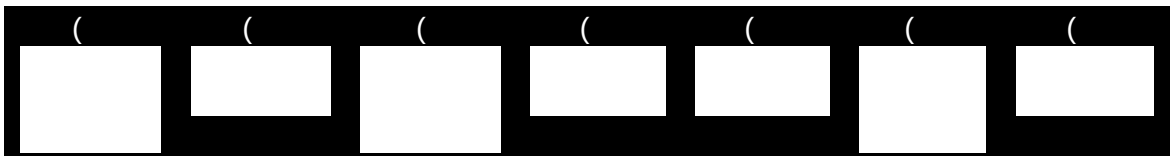


شماره	شرح	)	)	)	)	)	)	)
	سازمان ما مدیران و کارکنان خود را بر مبنای هوش و خلاقیت آنها انتخاب و گزینش مینماید.	☐	☐	☐	☐	☐	☐	☐
	سازمان ما قادر است حداکثر استفاده و منفعت را از	☐	☐	☐	☐	☐	☐	☐
	سازمان ما "به اشتراک گذاری دانش" را مابین مدیران و کارکنان ملزم مینماید	☐	☐	☐	☐	☐	☐	☐
	مدیران و کارکنان ما در انجام وظایف و	☐	☐	☐	☐	☐	☐	☐
	به طور کلی	☐	☐	☐	☐	☐	☐	☐
	به طور کلی	☐	☐	☐	☐	☐	☐	☐
	سیستمهای داده و اطلاعات سازمان دسترسی به اطلاعات مربوطه را تسهیل مینماید	☐	☐	☐	☐	☐	☐	☐
	میکنند	☐	☐	☐	☐	☐	☐	☐
	سازمان ما به اشتراک گذاری دانش را ملزم و یادگیری را ترغیب مینماید	☐	☐	☐	☐	☐	☐	☐
	در رابطه با	☐	☐	☐	☐	☐	☐	☐
	سازمان ما در پیگیری مستمر و همچنین در استفاده کامل از دارائیهای فکری ما نظیر اختراعات ثبت شده و کپی رایت (حق انحصاری اثر) توانمند است	☐	☐	☐	☐	☐	☐	☐
	از تولید	☐	☐	☐	☐	☐	☐	☐

شملره	شرح	)	)	)	)	)	)	)
	و به مقدار زیادی اعتبار و	□	□	□	□	□	□	□
	سازمان ما دانش را در پایگاه داده‌ها (دادگان یا بانک	□	□	□	□	□	□	□
	سازمان ما قادر است دانش و اطلاعات حیاتی سازمان را به منظور جلوگیری از از دست رفتن آن	□	□	□	□	□	□	□
	سازمان دارای مشتریهای وفادار نسبت به محصولات و	□	□	□	□	□	□	□
	بر مشتری مداری / بازار مداری	□	□	□	□	□	□	□
	سازمان ما در رابطه با برآورده کردن نیازها و	□	□	□	□	□	□	□
	سازمان ما دارای تعداد زیادی از مدیران و کارکنانی میباشد که در زمینه شناسایی بخشهای مختلف بازارهای هدف ومشتریان توانمند هستند.	□	□	□	□	□	□	□
	سازمان ما حداکثر میزان ممکن بازخورد را از مشتریان	□	□	□	□	□	□	□
	سازمان ما دارای کارکنان و مدیران بازاریابی میباشد که به طور مستمر با مشتریان به منظور شناسایی نیازها و توقعات آنها از سازمان ملاقات مینمایند.	□	□	□	□	□	□	□
	سازمان ما به شکایتهای مشتریان توجه و رسیدگی	□	□	□	□	□	□	□
	سازمان ما دارای روابط مناسبی با تامین کنندگانش	□	□	□	□	□	□	□
	را وقف بررسی،	□	□	□	□	□	□	□
	سازمان ما در حفظ روابط بلندمدت با تعدادی از تامین	□	□	□	□	□	□	□
	کارکنان ما از مهارت بالایی در زمینه همکاری با یکدیگر به منظور تشخیص و حل مشکلات برخوردار میباشند.	□	□	□	□	□	□	□
	کارکنان ما اطلاعات خود را به اشتراک می‌گذارانند و	□	□	□	□	□	□	□
	کارکنان ما در تعامل و تبادل ایده‌ها و افکار با افراد	□	□	□	□	□	□	□
	کارکنان ما دانش یک بخشی از سازمان را در جهت رفع مشکلات و یا استفاده از فرصتهای پیش آمده در	□	□	□	□	□	□	□

قسمت دوم: سیستم ارزیابی عملکرد

الف. آیتمهای زیر به بررسی جنبه هایی



شماره	(شاخصهای مالی)	)	)	)	)	)	)	)
	درآمد عملياتي	☐	☐	☐	☐	☐	☐	☐
	رشد فروش	☐	☐	☐	☐	☐	☐	☐
	نرخ بازده سرمايه گذاري	☐	☐	☐	☐	☐	☐	☐
	بازده حقوق صاحبان سهام	☐	☐	☐	☐	☐	☐	☐
	جريانات نقدی خالص	☐	☐	☐	☐	☐	☐	☐
	بهاي تمام شده هر واحد محصول	☐	☐	☐	☐	☐	☐	☐

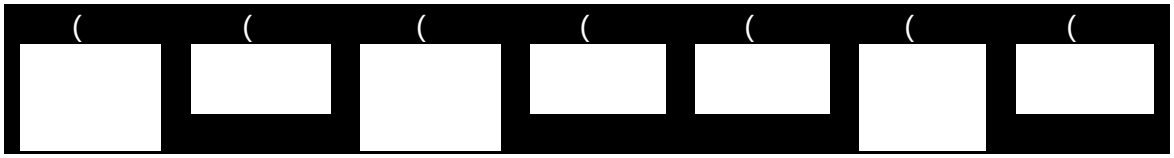
شماره	(شاخصهای مشتری)	)	)	)	)	)	)	)
		☐	☐	☐	☐	☐	☐	☐
	زمان واكنش (پاسخ) مشتري	☐	☐	☐	☐	☐	☐	☐
	تحويل	☐	☐	☐	☐	☐	☐	☐
	تعداد شکایات مشتری	☐	☐	☐	☐	☐	☐	☐
	تعداد درخواست برای گارانتی (ضمانت	☐	☐	☐	☐	☐	☐	☐
	بررسی رضایت مشتری	☐	☐	☐	☐	☐	☐	☐

شماره	(شاخصهای داخلی کسب و کار)	)	)	)	)	)	)	)
	انحراف کارایی مواد	□	□	□	□	□	□	□
	مدت زمان مورد نیاز براي توليد	□	□	□	□	□	□	□
	نرخ کاهش ضایعات مواد	□	□	□	□	□	□	□
	انحراف کارآيي دستمزد/ نيروي کار	□	□	□	□	□	□	□

شماره	(شاخصهای یادگیری و نوآوری)	)	)	)	)	)	)	)
	تعداد اختراعات جدید	□	□	□	□	□	□	□
	تعداد محصولات جدید ارائه شده	□	□	□	□	□	□	□
	زمان ورود به بازار برای محصولات جدید	□	□	□	□	□	□	□
	رضایت کارکنان	□	□	□	□	□	□	□

شماره	(شاخصهای اجتماعی و زیست‌محیطی)	)	)	)	)	)	)	)
	گوناگونی کارکنان	□	□	□	□	□	□	□
	اثرات اقتصادی (به استثنای شاخصهای مالی استفاده شده صورت حساب‌های مالی)در	□	□	□	□	□	□	□
	امنیت و سلامت شغلی	□	□	□	□	□	□	□
	مشارکت سهامداران در مسائل اجتماعی و زیست‌محیطی	□	□	□	□	□	□	□
	روابط اجتماعی	□	□	□	□	□	□	□
	حفاظت از منابع طبیعی و سطح انتشار آلاینده ها	□	□	□	□	□	□	□
	سایر مسائل اجتماعی، اخلاقی	□	□	□	□	□	□	□

ب. آیتمهای زیر به بررسی جنبه‌هایی



شماره	کاربرد تشخیصی	)	)	)	)	)	)	)
	پیگیری پیشرفت در جهت اهداف	□	□	□	□	□	□	□
	کنترل و نظارت بر نتایج	□	□	□	□	□	□	□
	مقایسه نتایج با انتظارات اولیه	□	□	□	□	□	□	□
	مرور شاخص‌های کلیدی	□	□	□	□	□	□	□
	کاربرد تعاملی	)	)	)	)	)	)	)
	فراهم کردن امکان بحث و تبادل نظر در ملاقاتِ مافوق ها، زیردستان و هم تراز ها	□	□	□	□	□	□	□
	فراهم کردن چالش مستمر و مباحثه در مورد اطلاعات اساسی،فرضیات و برنامه‌های کاری	□	□	□	□	□	□	□
	فراهم کردن یک نظر و دید مشترک از سازمان	□	□	□	□	□	□	□
	پیوند زدن اجزای مختلف سازمان به یکدیگر	□	□	□	□	□	□	□
	متمرکز ساختن سازمان بر روی مسائل مشترک	□	□	□	□	□	□	□
	(حیاتی)	□	□	□	□	□	□	□
	توسعه دادن واژگان و اصطلاحات مشترک در سازمان	□	□	□	□	□	□	□

قسمت سوم: فرهنگ سازمانی

این سوالات تعیین کننده نوع سازمانی است که بیشترین شباهت را به سازمان شما دارد. هر کدام از این ایتمها شامل چهار تعریف یا توصیف در ارتباط با سازمان‌ها می‌باشد. خواهشمند است با در نظر گرفتن میزان شباهت هر یک از این تعاریف به سازمان شما، امتیاز

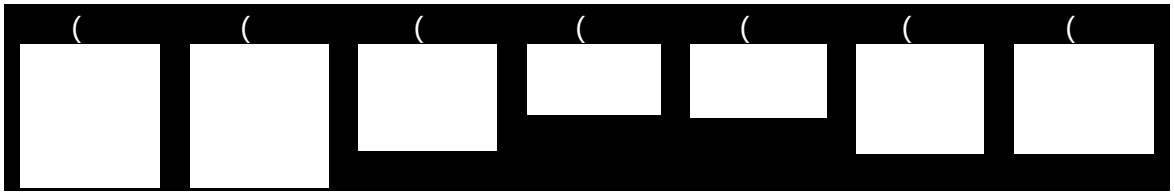
را -

را توزیع -

از اعتماد میپردازد. لطفا با تیک زدن در جاهای تعیین شده ارزیابی نمایید تا

قسمت پنجم: عملکرد سازمانی

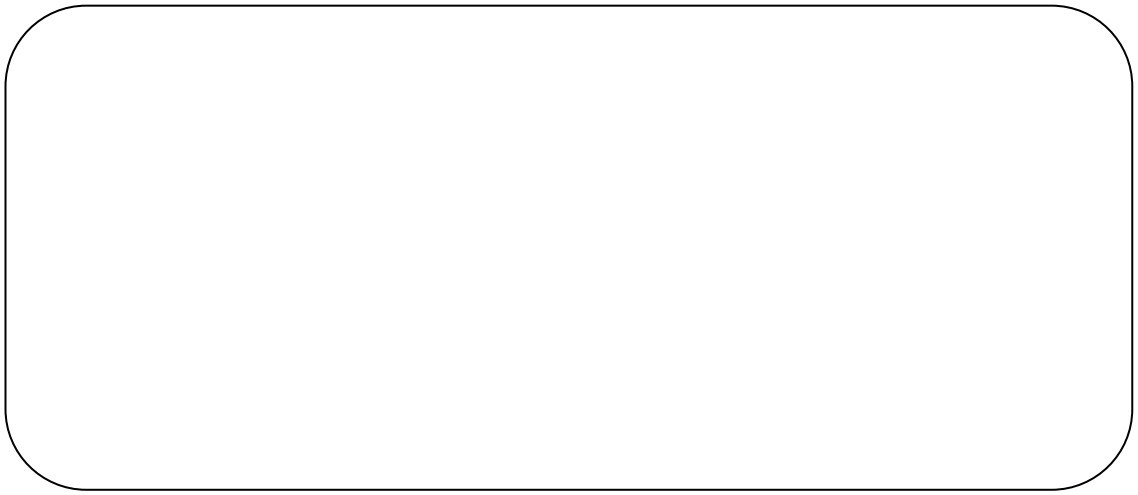
لطفا در پاسخ به آیتمهای زیر با تیک زدن در جاهای تعیین شده ارزیابی خود را از عملکرد سازمانتان در سال اخیر و در مقایسه با سایر رقبا در صنعت بیان نمایید.



شماره		)	)	)	)	)	)	)
	نرخ بازده سرمایه گذاري	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
	جریانهای نقدی حاصل از عملیات	☐	☐	☐	☐	☐	☐	☐
	کنترل هزینه (کنترل بهاي تمام شده)	☐	☐	☐	☐	☐	☐	☐
	توسعه محصولات جدید	☐	☐	☐	☐	☐	☐	☐
	حجم فروش	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐
	توسعه بازار	☐	☐	☐	☐	☐	☐	☐
	توسعه پرسنلی	☐	☐	☐	☐	☐	☐	☐
	روابط سیاسی عمومی	☐	☐	☐	☐	☐	☐	☐

قسمت ششم: اطلاعات کلی

بسیار سپاسگزار خواهم شد اگر اطلاعات زیر را در اختیار اینجانب بگذارید. این اطلاعات ما را در جهت
که با علامت سه



APPENDIX (B)

- **PILOT STUDY RESULTS (RELIABILITY)**
- **CRONBACH‘S ALPHA**
- **ITEM-TOTAL CORELLATION**

1) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR ORGANIZATIONAL CULTURE

```
/VARIABLES=OCICSUM OCILSUM OCICOSUM OCIESUM
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=CORR
/SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	35	100.0
	Excluded[a]	0	.0
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.612	.723	4

Inter-Item Correlation Matrix

	OCICSUM	OCILSUM	OCICOSUM	OCIESUM
OCICSUM	1.000	.067	.215	.010
OCILSUM	.067	1.000	.984	.547
OCICOSUM	.215	.984	1.000	.542
OCIESUM	.010	.547	.542	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OCICSUM	286.8571	2153.067	.063	.707	.685
OCILSUM	290.0000	1107.353	.682	.990	.302
OCICOSUM	288.0000	1665.000	.802	.991	.487
OCIESUM	294.8571	578.655	.542	.307	.622

2) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR TRUST

```
/VARIABLES=TR1 TR2 TR3 TR4 TR5 TR6 TR7 TR8
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/STATISTICS=CORR
/SUMMARY=TOTAL.
```

Case Processing Summary

		N	%
Cases	Valid	32	91.4
	Excluded[a]	3	8.6
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.898	.901	8

Inter-Item Correlation Matrix

	TR1	TR2	TR3	TR4	TR5	TR6	TR7	TR8
TR1	1.000	.643	.762	.659	.574	.376	.527	.119
TR2	.643	1.000	.712	.521	.376	.189	.394	.201
TR3	.762	.712	1.000	.837	.474	.496	.587	.266
TR4	.659	.521	.837	1.000	.465	.530	.547	.348
TR5	.574	.376	.474	.465	1.000	.709	.844	.595
TR6	.376	.189	.496	.530	.709	1.000	.779	.697
TR7	.527	.394	.587	.547	.844	.779	1.000	.669
TR8	.119	.201	.266	.348	.595	.697	.669	1.000

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
TR1	34.0625	56.770	.692	.731	.884
TR2	34.4688	59.031	.565	.637	.898
TR3	33.8750	57.468	.798	.859	.874
TR4	33.6250	58.306	.734	.741	.880
TR5	33.8438	60.394	.746	.786	.880
TR6	33.3750	62.565	.679	.737	.886
TR7	34.0938	54.604	.795	.818	.873
TR8	33.6875	64.867	.499	.650	.900

3) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR HUMAN CAPITAL

```
RELIABILITY
/VARIABLES=HIC1 HIC2 HIC3 HIC4 HIC5 HIC6
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	32	91.4
	Excluded[a]	3	8.6
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.839	.852	6

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.489	.238	.652	.414	2.736	.014

Summary Item Statistics

	N of Items
Inter-Item Correlations	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
HIC1	24.8125	22.996	.523	.401	.845
HIC2	24.6250	24.758	.631	.487	.809
HIC3	24.8125	24.157	.624	.431	.811
HIC4	24.0000	26.516	.594	.561	.818
HIC5	24.6875	25.835	.631	.470	.811
HIC6	24.5625	24.190	.785	.666	.783

4) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR STRUCTURAL CAPITAL

```
RELIABILITY
 /VARIABLES=SIC1 SIC2 SIC3 SIC4 SIC5 SIC6 SIC7 SIC8 SIC9
/SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	34	97.1
	Excluded[a]	1	2.9
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.892	.891	9

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.476	.148	.840	.692	5.673	.022

Summary Item Statistics

	N of Items
Inter-Item Correlations	9

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SIC1	36.1471	84.372	.546	.636	.888
SIC2	36.5000	80.379	.661	.791	.879
SIC3	36.8235	79.362	.676	.691	.878
SIC4	37.3529	75.993	.745	.772	.872
SIC5	37.5000	76.803	.741	.794	.873
SIC6	36.4412	82.133	.632	.509	.882
SIC7	36.9118	83.719	.521	.648	.890
SIC8	36.7647	77.216	.767	.797	.871
SIC9	36.6176	82.910	.555	.502	.888

5) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR RELATIONAL CAPITAL

```
RELIABILITY
/VARIABLES=RIC1 RIC2 RIC3 RIC4 RIC5 RIC6 RIC7 RIC8 RIC9 RIC10
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	35	100.0
	Excluded[a]	0	.0
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.945	.947	10

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.643	.430	.857	.427	1.994	.011

Summary Item Statistics

	N of Items
Inter-Item Correlations	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
RIC1	45.5429	93.197	.691	.738	.942
RIC2	45.2571	92.020	.830	.895	.937
RIC3	45.2857	91.798	.845	.839	.936
RIC4	45.9714	87.793	.762	.743	.940
RIC5	46.0000	89.588	.764	.761	.939
RIC6	46.0857	89.728	.744	.718	.940
RIC7	45.3143	91.692	.688	.746	.943
RIC8	45.2286	90.123	.806	.798	.937
RIC9	45.4000	92.071	.833	.810	.936
RIC10	45.0571	92.997	.811	.822	.938

6) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR SOCIAL CAPITAL

```
 RELIABILITY
 /VARIABLES=SOIC1 SOIC2 SOIC3 SOIC4
 /SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	35	100.0
	Excluded[a]	0	.0
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.939	.939	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.794	.691	.888	.197	1.285	.006

Summary Item Statistics

	N of Items
Inter-Item Correlations	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
SOIC1	13.7143	14.151	.770	.662	.946
SOIC2	13.9714	13.205	.904	.825	.905
SOIC3	14.0000	13.059	.880	.832	.912
SOIC4	13.9429	12.703	.871	.809	.916

7) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (FINANCIAL PERSPECTIVE)

```
RELIABILITY
/VARIABLES=DMF1 DMF2 DMF3 DMF4 DMF5 DMF6
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	33	94.3
	Excluded[a]	2	5.7
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.846	.864	6

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.514	.263	.849	.586	3.231	.029

Summary Item Statistics

	N of Items
Inter-Item Correlations	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMF1	27.2424	29.689	.767	.750	.804
DMF2	27.0000	31.688	.677	.754	.823
DMF3	28.3030	23.968	.788	.826	.785
DMF4	28.0909	26.460	.584	.753	.835
DMF5	27.7273	29.767	.534	.426	.837
DMF6	27.2424	28.564	.563	.494	.833

8) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (CUSTOMER PERSPECTIVE)

```
RELIABILITY
/VARIABLES=DMC1 DMC2 DMC3 DMC4 DMC5 DMC6
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	24	68.6
	Excluded[a]	11	31.4
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.846	.861	6

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.507	.310	.809	.499	2.609	.022

Summary Item Statistics

	N of Items
Inter-Item Correlations	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMC1	22.9167	36.428	.694	.702	.809
DMC2	22.8333	36.841	.747	.778	.802
DMC3	22.5000	36.696	.614	.486	.823
DMC4	23.7917	32.955	.753	.698	.794
DMC5	24.2083	33.737	.523	.538	.857
DMC6	22.9167	42.080	.562	.583	.837

9) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (CUSTOMER PERSPECTIVE)

```
RELIABILITY
/VARIABLES=DMC1 DMC2 DMC3 DMC4 DMC6
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	33	94.3
	Excluded[a]	2	5.7
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.852	.861	5

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.554	.340	.719	.380	2.118	.015

Summary Item Statistics

	N of Items
Inter-Item Correlations	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMC1	20.4242	22.564	.709	.610	.809
DMC2	20.3333	22.854	.817	.705	.786
DMC3	20.0000	23.375	.669	.493	.820
DMC4	21.2424	20.189	.644	.479	.840
DMC6	20.3030	26.968	.555	.489	.849

10) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (INTERNAL BUSINESS PROCESS PERSPECTIVE)

```
RELIABILITY
 /VARIABLES=DMI1 DMI2 DMI3 DMI4
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	31	88.6
	Excluded[a]	4	11.4
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.955	.956	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.844	.788	.903	.115	1.146	.001

Summary Item Statistics

	N of Items
Inter-Item Correlations	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMI1	12.0323	28.766	.908	.847	.936
DMI2	11.7742	30.047	.928	.871	.931
DMI3	12.0323	29.699	.861	.762	.950
DMI4	12.1613	30.540	.868	.762	.948

11) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (LEARNING AND INNOVATION PERSPECTIVE)

```
RELIABILITY
/VARIABLES=DML1 DML2 DML3 DML4
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	32	91.4
	Excluded[a]	3	8.6
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.810	.801	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.502	.173	.794	.621	4.587	.063

Summary Item Statistics

	N of Items
Inter-Item Correlations	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DML1	11.8125	23.383	.662	.634	.749
DML2	11.1563	18.201	.798	.783	.670
DML3	10.8750	19.403	.777	.665	.683
DML4	10.2188	28.757	.320	.196	.884

12) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR DIVERSITY OF MEASUREMENT (SOCIAL AND ENVIRONMENTAL PERSPECTIVE)

```
RELIABILITY
/VARIABLES=DMS1 DMS2 DMS3 DMS4 DMS5 DMS6 DMS7
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	33	94.3
	Excluded[a]	2	5.7
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.795	.796	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.358	.027	.808	.781	30.262	.039

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMS1	27.2424	35.502	.465	.397	.780
DMS2	26.6667	35.292	.555	.527	.764
DMS3	26.7576	37.189	.489	.411	.776
DMS4	27.8788	30.485	.699	.541	.731
DMS5	27.0303	35.718	.474	.527	.778
DMS6	26.6970	34.655	.466	.724	.780
DMS7	26.8182	33.528	.537	.757	.766

13) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR PMS USE (DIAGNOSTIC)

```
RELIABILITY
/VARIABLES=PMSUD1 PMSUD2 PMSUD3 PMSUD4
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	34	97.1
	Excluded[a]	1	2.9
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.972	.973	4

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.902	.863	.947	.084	1.097	.001

Summary Item Statistics

	N of Items
Inter-Item Correlations	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUD1	15.6471	19.144	.904	.825	.973
PMSUD2	15.3824	20.122	.955	.930	.957
PMSUD3	15.4412	20.254	.932	.901	.963
PMSUD4	15.6471	20.235	.940	.890	.961

14) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR PMS USE (INTERACTIVE)

```
RELIABILITY
 /VARIABLES=PMSUI1 PMSUI2 PMSUI3 PMSUI4 PMSUI5 PMSUI6 PMSUI7
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	34	97.1
	Excluded[a]	1	2.9
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.978	.978	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.865	.761	.966	.205	1.269	.003

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUI1	28.4118	79.583	.831	.780	.980
PMSUI2	28.4412	76.133	.922	.886	.974
PMSUI3	28.3824	78.183	.942	.906	.973
PMSUI4	28.3824	74.365	.936	.922	.973
PMSUI5	28.2941	74.517	.953	.974	.972
PMSUI6	28.2353	76.670	.926	.949	.974
PMSUI7	28.5588	76.678	.919	.876	.974

15) RELIABILITY RESULTS & ITEM-TOTAL STATISTICS FOR ORGANIZATIONAL PERFROMANCE

```
RELIABILITY
/VARIABLES=OP1 OP2 OP3 OP4 OP5 OP6 OP7 OP8 OP9 OP10
/SCALE('ALL VARIABLES') ALL
/MODEL=ALPHA
/SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	30	85.7
	Excluded[a]	5	14.3
	Total	35	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.963	.964	10

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.727	.428	.933	.505	2.180	.012

Summary Item Statistics

	N of Items
Inter-Item Correlations	10

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
OP1	39.6000	210.800	.880	.901	.957
OP2	39.2667	211.857	.865	.934	.958
OP3	39.0000	219.793	.879	.872	.958
OP4	39.0000	231.586	.710	.693	.964
OP5	39.6667	212.644	.797	.806	.961
OP6	38.8667	218.189	.800	.884	.961
OP7	39.2333	214.185	.864	.899	.958
OP8	39.4000	216.524	.939	.950	.956
OP9	39.9000	206.231	.915	.881	.956
OP10	39.3667	226.171	.719	.786	.963

APENDIX (C)

APPENDIX (C)

1) RESPONSE BIAS ANALYSIS

2) NORMALITY TEST

3) COMMON METHOD BIAS

4) EFA for Diversity of Measurement Variable

1) RESPONSE BIAS ANALYSIS (Independent T- Test)

Group Statistics

	RT	N	Mean	Std. Deviation	Std. Error Mean
HICE	early	51	4.7737	1.12431	.15743
	late	77	4.8896	1.03939	.11845
SICE	early	51	4.6863	1.27264	.17820
	late	77	4.8831	.93152	.10616
RICE	early	51	5.1176	1.22714	.17183
	late	77	5.3506	.95650	.10900
SOICE	early	51	4.5686	1.37484	.19252
	late	77	4.6234	1.28799	.14678
DMFE	early	51	4.2384	1.54196	.21592
	late	77	4.4135	1.48412	.16913
DMCE	early	51	4.5712	1.19752	.16769
	late	77	4.6409	1.19153	.13579
DMIE	early	51	4.4991	1.34834	.18881
	late	77	4.7095	1.37436	.15662
DMLE	early	51	4.3824	1.58379	.22177
	late	77	4.5710	1.47642	.16825
DMSE	early	51	4.4098	1.29727	.18165
	late	77	4.6597	1.12896	.12866
PMSDE	early	51	4.9314	1.38931	.19454
	late	77	5.3301	1.24049	.14137
PMSIE	early	51	4.4784	1.48557	.20802
	late	77	4.8325	1.33825	.15251
OPE	early	51	4.3035	1.51050	.21151
	late	77	4.2835	1.53796	.17527
FLX/CNTRL	early	51	-25.0592	45.72151	6.40229
	late	77	-21.6234	36.05498	4.10885
tsrt	early	51	4.633600	1.3712767	.1920172
	late	77	4.736147	1.3368561	.1523489

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
HICE	Equal variances assumed	.060	.806	-.598	126	.551
	Equal variances not assumed			-.588	101.278	.558
SICE	Equal variances assumed	6.455	.012	-1.010	126	.315
	Equal variances not assumed			-.949	84.760	.345
RICE	Equal variances assumed	1.977	.162	-1.204	126	.231
	Equal variances not assumed			-1.145	88.869	.255
SOICE	Equal variances assumed	.011	.918	-.229	126	.819
	Equal variances not assumed			-.226	102.286	.822
DMFE	Equal variances assumed	.009	.925	-.643	126	.521
	Equal variances not assumed			-.638	104.339	.525
DMCE	Equal variances assumed	.052	.820	-.324	126	.747
	Equal variances not assumed			-.323	106.847	.747
DMIE	Equal variances assumed	.063	.802	-.855	126	.394
	Equal variances not assumed			-.858	108.645	.393
DMLE	Equal variances assumed	.401	.528	-.688	126	.493
	Equal variances not assumed			-.678	101.911	.499
DMSE	Equal variances assumed	1.000	.319	-1.155	126	.250
	Equal variances not assumed			-1.123	96.730	.264
PMSDE	Equal variances assumed	1.005	.318	-1.697	126	.092
	Equal variances not assumed			-1.658	98.649	.100
PMSIE	Equal variances assumed	.927	.337	-1.402	126	.163

	Equal variances not assumed			-1.373	99.317	.173
OPE	Equal variances assumed	.008	.928	.073	126	.942
	Equal variances not assumed			.073	108.564	.942
FLX/CNTRL	Equal variances assumed	4.021	.047	-.474	126	.636
	Equal variances not assumed			-.452	89.663	.653
tsrt	Equal variances assumed	.122	.728	-.421	126	.675
	Equal variances not assumed			-.418	105.309	.677

Independent Samples Test

		t-test for Equality of Means			
				95% Confidence Interval of the Difference	
		Mean Difference	Std. Error Difference	Lower	Upper
HICE	Equal variances assumed	-.11588	.19388	-.49957	.26780
	Equal variances not assumed	-.11588	.19702	-.50670	.27493
SICE	Equal variances assumed	-.19684	.19496	-.58266	.18897
	Equal variances not assumed	-.19684	.20743	-.60928	.21560
RICE	Equal variances assumed	-.23300	.19356	-.61605	.15005
	Equal variances not assumed	-.23300	.20349	-.63734	.17134
SOICE	Equal variances assumed	-.05475	.23888	-.52749	.41799
	Equal variances not assumed	-.05475	.24209	-.53492	.42542
DMFE	Equal variances assumed	-.17508	.27214	-.71362	.36347
	Equal variances not assumed	-.17508	.27427	-.71895	.36880
DMCE	Equal variances assumed	-.06973	.21555	-.49630	.35683
	Equal variances not assumed	-.06973	.21577	-.49748	.35801
DMIE	Equal variances assumed	-.21044	.24627	-.69781	.27693
	Equal variances not assumed	-.21044	.24531	-.69666	.27578

DMLE	Equal variances assumed	-.18869	.27441	-.73174	.35436
	Equal variances not assumed	-.18869	.27838	-.74085	.36348
DMSE	Equal variances assumed	-.24994	.21639	-.67817	.17830
	Equal variances not assumed	-.24994	.22260	-.69175	.19188
PMSDE	Equal variances assumed	-.39876	.23499	-.86379	.06628
	Equal variances not assumed	-.39876	.24048	-.87595	.07843
PMSIE	Equal variances assumed	-.35404	.25250	-.85372	.14565
	Equal variances not assumed	-.35404	.25794	-.86582	.15775
OPE	Equal variances assumed	.02002	.27571	-.52559	.56564
	Equal variances not assumed	.02002	.27469	-.52443	.56448
FLX/CNTRL	Equal variances assumed	-3.43584	7.25236	-17.78804	10.91636
	Equal variances not assumed	-3.43584	7.60736	-18.54997	11.67829
tsrt	Equal variances assumed	-.1025468	.2438416	-.5851020	.3800085
	Equal variances not assumed	-.1025468	.2451138	-.5885455	.3834520

2) NORMALITY TESTS

Descriptive Statistics

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HIC1	128	4.7180	1.63098	-.408	.214	-.697	.425
HIC2	128	4.77	1.539	-.493	.214	-.465	.425
HIC3	128	4.7559	1.35575	-.488	.214	.203	.425
HIC4	128	5.16	1.254	-.486	.214	-.112	.425
HIC5	128	4.91	1.232	-.434	.214	-.060	.425
HIC6	128	4.7505	1.26129	-.282	.214	-.126	.425
SIC1	128	4.87	1.282	-.340	.214	-.440	.425
SIC2	128	4.66	1.427	-.346	.214	-.205	.425
SIC3	128	4.96	1.471	-.520	.214	-.173	.425
SIC4	128	4.95	1.539	-.540	.214	-.205	.425
SIC5	128	4.6645	1.49669	-.553	.214	.024	.425
SIC6	128	5.24	1.297	-.748	.214	.699	.425
SIC7	128	4.72	1.363	-.557	.214	-.270	.425
SIC8	128	4.51	1.328	-.529	.214	.146	.425
SIC9	128	4.66	1.226	-.564	.214	-.141	.425
RIC1	128	4.92	1.208	-.611	.214	.348	.425
RIC2	128	5.59	1.105	-.506	.214	-.256	.425
RIC3	128	5.59	1.220	-.612	.214	-.262	.425
RIC4	128	4.77	1.666	-.505	.214	-.669	.425
RIC5	128	4.92	1.663	-.469	.214	-.634	.425
RIC6	128	4.91	1.458	-.313	.214	-.616	.425
RIC7	128	5.48	1.516	-.961	.214	.276	.425
RIC8	128	5.23	1.360	-.588	.214	-.290	.425
RIC9	128	5.09	1.264	-.678	.214	.362	.425
RIC10	128	5.38	1.281	-.432	.214	-.645	.425
SOIC1	128	4.49	1.631	-.400	.214	-.501	.425
SOIC2	128	4.92	1.326	-.555	.214	.191	.425
SOIC3	128	4.18	1.676	-.452	.214	-.560	.425
SOIC4	128	4.36	1.606	-.466	.214	-.566	.425

DMF1	128	4.7019	1.84930	-.540	.214	-.638	.425
DMF2	128	4.7247	1.85040	-.527	.214	-.722	.425
DMF3	128	3.5428	1.72143	.275	.214	-.777	.425
DMF4	128	4.014766	1.9916443	-.130	.214	-1.243	.425
DMF5	128	4.2775	1.90383	-.245	.214	-1.006	.425
DMF6	128	4.8011	1.70021	-.378	.214	-.757	.425
DMC1	128	4.4564	1.62719	-.154	.214	-.804	.425
DMC2	128	4.9084	1.28273	-.532	.214	.343	.425
DMC3	128	4.9458	1.42028	-.709	.214	.443	.425
DMC4	128	3.878047	1.7929179	.036	.214	-1.019	.425
DMC6	128	4.8771	1.34615	-.482	.214	-.008	.425
DMI1	128	4.474609	1.5504126	-.151	.214	-.620	.425
DMI2	128	4.408125	1.7020922	-.332	.214	-.650	.425
DMI3	128	4.7672	1.69453	-.436	.214	-.592	.425
DMI4	128	4.8527	1.58718	-.702	.214	-.026	.425
DML1	128	4.4113	1.83173	-.449	.214	-.685	.425
DML2	128	4.5391	1.80358	-.410	.214	-.736	.425
DML3	128	4.4309	1.74424	-.340	.214	-.650	.425
DML4	128	4.60	1.584	-.467	.214	-.384	.425
DMS1	128	4.509	1.4413	-.195	.214	-.382	.425
DMS2	128	4.730781	1.4275923	-.040	.214	-.745	.425
DMS3	128	4.68	1.452	-.254	.214	-.441	.425
DMS4	128	4.37	1.655	-.297	.214	-.583	.425
DMS5	128	4.44	1.499	-.184	.214	-.575	.425
DMS6	128	4.7495	1.40855	-.110	.214	-.669	.425
DMS7	128	4.45	1.678	-.345	.214	-.544	.425
PMSUD1	128	5.1255	1.49009	-.552	.214	-.259	.425
PMSUD2	128	5.291	1.2866	-.653	.214	.410	.425
PMSUD3	128	5.2362	1.33668	-.544	.214	-.002	.425
PMSUD4	128	5.0318	1.44144	-.441	.214	-.465	.425
PMSUI1	128	4.740	1.5018	-.466	.214	-.253	.425
PMSUI2	128	4.7161	1.46830	-.586	.214	-.118	.425
PMSUI3	128	4.693203	1.3833230	-.392	.214	-.382	.425
PMSUI4	128	4.709	1.5477	-.354	.214	-.529	.425
PMSUI5	128	4.716641	1.5517211	-.401	.214	-.419	.425
PMSUI6	128	4.7798	1.53137	-.396	.214	-.352	.425
PMSUI7	128	4.4652	1.54103	-.216	.214	-.691	.425
TR1	128	4.5746	1.66256	-.331	.214	-.698	.425

TR2	128	4.330234	1.6932332	-.187	.214	-.963	.425
TR3	128	4.732578	1.3772592	-.405	.214	.049	.425
TR4	128	5.06	1.390	-.595	.214	-.019	.425
TR5	128	4.87	1.118	-.317	.214	-.120	.425
TR6	128	5.3183	1.13397	-.428	.214	.496	.425
TR7	128	4.5425	1.53532	-.267	.214	-.471	.425
TR8	128	5.00	1.191	-.683	.214	.922	.425
OP1	128	4.1108	1.88330	-.148	.214	-1.155	.425
OP2	128	4.173672	1.9323035	-.157	.214	-1.176	.425
OP3	128	4.4614	1.62003	-.218	.214	-.802	.425
OP4	128	4.715156	1.5362302	-.342	.214	-.584	.425
OP5	128	3.9859	1.94002	-.079	.214	-1.083	.425
OP6	128	4.629844	1.6918847	-.421	.214	-.603	.425
OP7	128	4.475000	1.8806935	-.310	.214	-.923	.425
OP8	128	4.2343	1.67026	-.092	.214	-.800	.425
OP9	128	3.8494	1.86162	-.059	.214	-1.031	.425
OP10	128	4.278906	1.5351218	-.111	.214	-.634	.425
FLX/CNTRL	128	-22.9923	40.04742	.356	.214	-.372	.425
Valid N (listwise)	128						

3) COMMON METHOD BIAS TEST

Factor Analysis

Communalities

	Initial	Extraction
HIC1	1.000	.537
HIC2	1.000	.478
HIC3	1.000	.309
HIC4	1.000	.446
HIC5	1.000	.414
HIC6	1.000	.552
SIC1	1.000	.338
SIC2	1.000	.488
SIC3	1.000	.385
SIC4	1.000	.283
SIC5	1.000	.387
SIC6	1.000	.300
SIC7	1.000	.451
SIC8	1.000	.601
SIC9	1.000	.409
RIC1	1.000	.325
RIC2	1.000	.454
RIC3	1.000	.340
RIC4	1.000	.416

RIC5	1.000	.293
RIC6	1.000	.587
RIC7	1.000	.311
RIC8	1.000	.290
RIC9	1.000	.489
RIC10	1.000	.301
SOIC1	1.000	.452
SOIC2	1.000	.518
SOIC3	1.000	.283
SOIC4	1.000	.269
DMF1	1.000	.246
DMF2	1.000	.265
DMF3	1.000	.176
DMF4	1.000	.296
DMF5	1.000	.380
DMF6	1.000	.388
DMC1	1.000	.172
DMC2	1.000	.470
DMC3	1.000	.375
DMC4	1.000	.421
DMC6	1.000	.512
DMI1	1.000	.214
DMI2	1.000	.288
DMI3	1.000	.420
DMI4	1.000	.451

DML1	1.000	.301
DML2	1.000	.445
DML3	1.000	.577
DML4	1.000	.690
DMS1	1.000	.500
DMS2	1.000	.653
DMS3	1.000	.677
DMS4	1.000	.608
DMS5	1.000	.656
DMS6	1.000	.221
DMS7	1.000	.361
PMSUD1	1.000	.669
PMSUD2	1.000	.787
PMSUD3	1.000	.717
PMSUD4	1.000	.756
PMSUI1	1.000	.774
PMSUI2	1.000	.771
PMSUI3	1.000	.757
PMSUI4	1.000	.711
PMSUI5	1.000	.794
PMSUI6	1.000	.753
PMSUI7	1.000	.683
TR1	1.000	.512
TR2	1.000	.311
TR3	1.000	.511

TR4	1.000	.440
TR5	1.000	.308
TR6	1.000	.268
TR7	1.000	.308
TR8	1.000	.114
OP1	1.000	.563
OP2	1.000	.521
OP3	1.000	.585
OP4	1.000	.434
OP5	1.000	.549
OP6	1.000	.286
OP7	1.000	.383
OP8	1.000	.447
OP9	1.000	.565
OP10	1.000	.478
FLX/CNTRL	1.000	.140

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	38.366	45.137	45.137	38.366	45.137	45.137
2	4.807	5.656	50.792			
3	4.408	5.186	55.979			
4	3.815	4.489	60.467			
5	3.309	3.893	64.360			
6	2.596	3.054	67.415			
7	2.440	2.871	70.286			
8	2.192	2.578	72.864			
9	1.926	2.266	75.129			
10	1.535	1.806	76.936			
11	1.254	1.476	78.412			
12	1.134	1.334	79.746			
13	1.089	1.281	81.027			
14	.967	1.137	82.164			
15	.908	1.068	83.232			
16	.848	.998	84.229			
17	.789	.928	85.157			
18	.762	.896	86.053			
19	.713	.839	86.892			
20	.697	.820	87.712			
21	.671	.789	88.501			

22	.615	.724	89.225			
23	.566	.666	89.891			
24	.545	.642	90.533			
25	.500	.588	91.121			
26	.452	.531	91.652			
27	.444	.522	92.174			
28	.412	.485	92.659			
29	.397	.467	93.126			
30	.351	.413	93.539			
31	.336	.396	93.935			
32	.314	.369	94.304			
33	.309	.363	94.667			
34	.300	.353	95.020			
35	.279	.328	95.348			
36	.250	.294	95.643			
37	.244	.287	95.930			
38	.227	.267	96.197			
39	.202	.237	96.434			
40	.194	.228	96.663			
41	.184	.216	96.878			
42	.171	.201	97.080			
43	.162	.191	97.270			
44	.157	.185	97.455			
45	.148	.174	97.630			
46	.145	.170	97.800			

47	.140	.165	97.965			
48	.130	.153	98.118			
49	.121	.142	98.260			
50	.116	.137	98.397			
51	.111	.131	98.528			
52	.098	.116	98.644			
53	.094	.111	98.755			
54	.090	.105	98.860			
55	.077	.091	98.951			
56	.075	.088	99.039			
57	.072	.085	99.124			
58	.066	.078	99.201			
59	.056	.065	99.267			
60	.053	.063	99.330			
61	.053	.063	99.393			
62	.049	.058	99.450			
63	.045	.053	99.503			
64	.044	.051	99.554			
65	.038	.045	99.599			
66	.035	.042	99.640			
67	.034	.040	99.680			
68	.032	.038	99.719			
69	.030	.035	99.754			
70	.027	.032	99.786			
71	.025	.029	99.815			

72	.020	.024	99.839			
73	.018	.022	99.861			
74	.017	.020	99.881			
75	.016	.019	99.900			
76	.015	.018	99.917			
77	.013	.015	99.933			
78	.013	.015	99.948			
79	.010	.011	99.959			
80	.009	.011	99.969			
81	.007	.009	99.978			
82	.006	.007	99.985			
83	.005	.006	99.991			
84	.005	.005	99.996			
85	.003	.004	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
HIC1	.733
HIC2	.692
HIC3	.556
HIC4	.668
HIC5	.643
HIC6	.743
SIC1	.581
SIC2	.698
SIC3	.620
SIC4	.532
SIC5	.622
SIC6	.548
SIC7	.672
SIC8	.775
SIC9	.640
RIC1	.570
RIC2	.674
RIC3	.583
RIC4	.645
RIC5	.541
RIC6	.766

RIC7	.557
RIC8	.539
RIC9	.699
RIC10	.549
SOIC1	.673
SOIC2	.720
SOIC3	.532
SOIC4	.519
DMF1	.496
DMF2	.515
DMF3	.420
DMF4	.544
DMF5	.616
DMF6	.623
DMC1	.414
DMC2	.685
DMC3	.612
DMC4	.649
DMC6	.716
DMI1	.463
DMI2	.537
DMI3	.648
DMI4	.671
DML1	.549
DML2	.667

DML3	.759
DML4	.831
DMS1	.707
DMS2	.808
DMS3	.823
DMS4	.780
DMS5	.810
DMS6	.470
DMS7	.601
PMSUD1	.818
PMSUD2	.887
PMSUD3	.846
PMSUD4	.870
PMSUI1	.880
PMSUI2	.878
PMSUI3	.870
PMSUI4	.843
PMSUI5	.891
PMSUI6	.868
PMSUI7	.827
TR1	.715
TR2	.558
TR3	.715
TR4	.663
TR5	.555

TR6	.518
TR7	.555
TR8	.338
OP1	.750
OP2	.722
OP3	.765
OP4	.659
OP5	.741
OP6	.535
OP7	.619
OP8	.669
OP9	.751
OP10	.691
FLX/CNTRL	.374

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

4) EXPLORATORY FACTOR ANALYSIS

(Diversity of measurement Variable)

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.880
Bartlett's Test of Sphericity	Approx. Chi-Square	3160.988
	df	325
	Sig.	.000

Communalities

	Initial	Extraction
DMF1	1.000	.793
DMF2	1.000	.777
DMF3	1.000	.712
DMF4	1.000	.849
DMF5	1.000	.755
DMF6	1.000	.639
DMC1	1.000	.611
DMC2	1.000	.783

DMC3	1.000	.637
DMC4	1.000	.731
DMC6	1.000	.655
DMI1	1.000	.817
DMI2	1.000	.807
DMI3	1.000	.746
DMI4	1.000	.805
DML1	1.000	.837
DML2	1.000	.871
DML3	1.000	.814
DML4	1.000	.709
DMS1	1.000	.775
DMS2	1.000	.822
DMS3	1.000	.816
DMS4	1.000	.854
DMS5	1.000	.819
DMS6	1.000	.799
DMS7	1.000	.729

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	11.863	45.627	45.627	11.863	45.627	45.627
2	3.693	14.205	59.833	3.693	14.205	59.833
3	2.102	8.083	67.916	2.102	8.083	67.916
4	1.280	4.924	72.840	1.280	4.924	72.840
5	1.022	3.933	76.773	1.022	3.933	76.773
6	.810	3.116	79.888			
7	.672	2.586	82.474			
8	.579	2.225	84.700			
9	.473	1.820	86.520			
10	.431	1.658	88.178			
11	.401	1.544	89.722			
12	.389	1.497	91.218			
13	.334	1.285	92.503			
14	.269	1.034	93.538			
15	.258	.993	94.531			
16	.230	.885	95.416			
17	.205	.788	96.204			
18	.173	.667	96.871			
19	.160	.617	97.488			
20	.135	.519	98.007			

21	.129	.495	98.502			
22	.098	.375	98.878			
23	.090	.346	99.223			
24	.079	.303	99.526			
25	.070	.269	99.796			
26	.053	.204	100.000			

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %
1	4.837	18.604	18.604
2	4.359	16.767	35.371
3	4.116	15.831	51.202
4	3.348	12.878	64.080
5	3.300	12.693	76.773
6			
7			
8			
9			
10			
11			
12			
13			
14			

15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component				
	1	2	3	4	5
DMF1	.544	.633			
DMF2	.586	.616			
DMF3	.459	.587			
DMF4	.596	.438		.467	
DMF5	.682	.425			

DMF6	.664				
DMC1	.528	.451			
DMC2	.702			-.463	
DMC3	.675				
DMC4	.757				
DMC6	.706				
DMI1	.574		.607		
DMI2	.626		.643		
DMI3	.686	-.480			
DMI4	.692	-.550			
DML1	.527	-.669			
DML2	.658	-.525			
DML3	.752				
DML4	.778				
DMS1	.726				
DMS2	.812				
DMS3	.827				
DMS4	.797	-.431			
DMS5	.798				
DMS6	.569		.565		
DMS7	.660		.499		

Extraction Method: Principal Component Analysis.

a. 5 components extracted.

Rotated Component Matrix[a]

	Component				
	1	2	3	4	5
DMF1			.795		
DMF2			.725		.436
DMF3			.800		
DMF4			.859		
DMF5		.401	.718		
DMF6					.578
DMC1			.402		.638
DMC2					.761
DMC3					.655
DMC4				.434	.574
DMC6		.525			.535
DMI1				.831	
DMI2				.763	
DMI3	.774				
DMI4	.731				
DML1	.887				
DML2	.898				
DML3	.800				
DML4	.465	.613			
DMS1		.765			
DMS2		.761			

DMS3		.710			
DMS4	.630	.600			
DMS5		.762			
DMS6				.835	
DMS7				.723	

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Component Transformation Matrix

Component	1	2	3	4	5
1	.492	.525	.401	.380	.421
2	-.655	-.162	.672	.025	.304
3	-.035	-.484	-.231	.837	.108
4	.395	-.353	.578	.052	-.619
5	.414	-.583	.016	-.390	.580

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

Factor Analysis

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	.000
	df	10

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.500
Bartlett's Test of Sphericity	Approx. Chi-Square	.000
	df	10
	Sig.	1.000

Communalities

	Initial	Extraction
DML	1.000	.079
DMS	1.000	.149
DMF	1.000	.140
DMI	1.000	.419
DMC	1.000	.213

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.000	20.000	20.000	1.000	20.000	20.000
2	1.000	20.000	40.000			
3	1.000	20.000	60.000			
4	1.000	20.000	80.000			
5	1.000	20.000	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
DML	
DMS	
DMF	
DMI	.647
DMC	.462

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Rotated Component Matrix[a]

a. Only one component was extracted. The solution cannot be rotated.

APENDIX (D)

APPENDIX (D)

Partial Aggregation for Nature of the PMS Use Construct

1) RELIABILITY

2) UNIDIMENSIONALITY

1)RELIABILITY

```
  /VARIABLES=PMSUD1PMSUI1 PMSUD1PMSUI2 PMSUD1PMSUI3
PMSUD1PMSUI4    PMSUD1PMSUI5 PMSUD1PMSUI6 PMSUD1PMSUI7
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.991	.992	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.944	.910	.983	.074	1.081	.001

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUD1*PMSUI1	153.905651	5826.760	.947	.944	.991
PMSUD1*PMSUI2	153.977548	5851.450	.953	.951	.991
PMSUD1*PMSUI3	154.412275	5891.058	.978	.960	.989
PMSUD1*PMSUI4	154.241588	5835.458	.964	.947	.990
PMSUD1*PMSUI5	154.091963	5793.559	.979	.978	.989
PMSUD1*PMSUI6	153.861835	5788.867	.976	.975	.989
PMSUD1*PMSUI7	155.544405	5869.820	.968	.953	.990

```
RELIABILITY
 /VARIABLES=PMSUD2PMSUI1 PMSUD2PMSUI2 PMSUD2PMSUI3
PMSUD2PMSUI4 PMSUD2PMSUI5 PMSUD2PMSUI6 PMSUD2PMSUI7
 /SCALE('ALL VARIABLES') ALL
 /MODEL=ALPHA
 /SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.991	.991	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.938	.903	.980	.077	1.085	.001

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUD2*PMSUI1	157.893805	5536.877	.942	.932	.990
PMSUD2*PMSUI2	158.067336	5572.934	.947	.939	.990
PMSUD2*PMSUI3	158.244125	5560.527	.974	.954	.989
PMSUD2*PMSUI4	158.034430	5486.383	.964	.944	.989
PMSUD2*PMSUI5	157.869125	5427.830	.978	.975	.988
PMSUD2*PMSUI6	157.537273	5424.597	.974	.971	.988
PMSUD2*PMSUI7	159.368766	5500.236	.965	.946	.989

```
RELIABILITY
  /VARIABLES=PMSUD3PMSUI1 PMSUD3PMSUI2 PMSUD3PMSUI3
PMSUD3PMSUI4 PMSUD3PMSUI5 PMSUD3PMSUI6 PMSUD3PMSUI7
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.991	.991	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.942	.906	.982	.076	1.084	.001

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUD3*PMSUI1	156.573701	5703.789	.943	.933	.991
PMSUD3*PMSUI2	156.606585	5716.100	.952	.943	.991
PMSUD3*PMSUI3	156.877162	5709.391	.976	.956	.989
PMSUD3*PMSUI4	156.714326	5645.229	.965	.946	.990
PMSUD3*PMSUI5	156.517787	5581.345	.980	.976	.989
PMSUD3*PMSUI6	156.264110	5589.564	.977	.972	.989
PMSUD3*PMSUI7	157.978267	5642.257	.968	.951	.990

```
RELIABILITY
  /VARIABLES=PMSUD4PMSUI1 PMSUD4PMSUI2 PMSUD4PMSUI3
PMSUD4PMSUI4 PMSUD4PMSUI5 PMSUD4PMSUI6 PMSUD4PMSUI7
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /SUMMARY=TOTAL CORR.
```

Case Processing Summary

		N	%
Cases	Valid	128	100.0
	Excluded[a]	0	.0
	Total	128	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.992	.992	7

Summary Item Statistics

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance
Inter-Item Correlations	.948	.920	.983	.063	1.069	.000

Summary Item Statistics

	N of Items
Inter-Item Correlations	7

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
PMSUD4*PMSUI1	151.507213	5897.191	.952	.947	.992
PMSUD4*PMSUI2	151.719735	5947.982	.955	.951	.992
PMSUD4*PMSUI3	151.935713	5935.777	.979	.962	.990
PMSUD4*PMSUI4	151.850963	5889.382	.969	.952	.991
PMSUD4*PMSUI5	151.615400	5828.774	.981	.978	.990
PMSUD4*PMSUI6	151.275898	5806.139	.979	.976	.990
PMSUD4*PMSUI7	152.974092	5886.840	.972	.957	.991

2)UNIDIMENSIONALITY

```
 FACTOR
  /VARIABLES PMSUD1PMSUI1 PMSUD1PMSUI2 PMSUD1PMSUI3
PMSUD1PMSUI4 PMSUD1PMSUI5 PMSUD1PMSUI6 PMSUD1PMSUI7
  /MISSING LISTWISE
  /ANALYSIS PMSUD1PMSUI1 PMSUD1PMSUI2 PMSUD1PMSUI3
PMSUD1PMSUI4 PMSUD1PMSUI5 PMSUD1PMSUI6 PMSUD1PMSUI7
  /PRINT INITIAL EXTRACTION
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.
```

Factor Analysis

Communalities

	Initial	Extraction
PMSUD1*PMSUI1	1.000	.923
PMSUD1*PMSUI2	1.000	.931
PMSUD1*PMSUI3	1.000	.969
PMSUD1*PMSUI4	1.000	.949
PMSUD1*PMSUI5	1.000	.970
PMSUD1*PMSUI6	1.000	.966
PMSUD1*PMSUI7	1.000	.955

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.663	95.188	95.188	6.663	95.188	95.188
2	.158	2.262	97.450			
3	.056	.796	98.246			
4	.042	.599	98.845			
5	.038	.537	99.382			
6	.031	.442	99.824			
7	.012	.176	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
PMSUD1*PMSUI1	.961
PMSUD1*PMSUI2	.965
PMSUD1*PMSUI3	.984
PMSUD1*PMSUI4	.974
PMSUD1*PMSUI5	.985
PMSUD1*PMSUI6	.983
PMSUD1*PMSUI7	.977

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

```
FACTOR
 /VARIABLES PMSUD2PMSUI1 PMSUD2PMSUI2 PMSUD2PMSUI3
PMSUD2PMSUI4 PMSUD2PMSUI5 PMSUD2PMSUI6 PMSUD2PMSUI7
 /MISSING LISTWISE
 /ANALYSIS PMSUD2PMSUI1 PMSUD2PMSUI2 PMSUD2PMSUI3
PMSUD2PMSUI4 PMSUD2PMSUI5 PMSUD2PMSUI6 PMSUD2PMSUI7
 /PRINT INITIAL EXTRACTION
 /CRITERIA MINEIGEN(1) ITERATE(25)
 /EXTRACTION PC
 /ROTATION NOROTATE
 /METHOD=CORRELATION.
```

Factor Analysis

Communalities

	Initial	Extraction
PMSUD2*PMSUI1	1.000	.917
PMSUD2*PMSUI2	1.000	.923
PMSUD2*PMSUI3	1.000	.963
PMSUD2*PMSUI4	1.000	.948
PMSUD2*PMSUI5	1.000	.969
PMSUD2*PMSUI6	1.000	.963
PMSUD2*PMSUI7	1.000	.949

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.631	94.735	94.735	6.631	94.735	94.735
2	.165	2.361	97.097			
3	.059	.847	97.944			
4	.047	.669	98.613			
5	.046	.660	99.273			
6	.037	.523	99.796			
7	.014	.204	100.000			

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.631	94.735	94.735	6.631	94.735	94.735
2	.165	2.361	97.097			
3	.059	.847	97.944			
4	.047	.669	98.613			
5	.046	.660	99.273			
6	.037	.523	99.796			
7	.014	.204	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
PMSUD2*PMSUI1	.957
PMSUD2*PMSUI2	.961
PMSUD2*PMSUI3	.981
PMSUD2*PMSUI4	.973
PMSUD2*PMSUI5	.984
PMSUD2*PMSUI6	.981
PMSUD2*PMSUI7	.974

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

```
FACTOR
  /VARIABLES PMSUD3PMSUI1 PMSUD3PMSUI2 PMSUD3PMSUI3
PMSUD3PMSUI4 PMSUD3PMSUI5 PMSUD3PMSUI6 PMSUD3PMSUI7
  /MISSING LISTWISE
  /ANALYSIS PMSUD3PMSUI1 PMSUD3PMSUI2 PMSUD3PMSUI3
PMSUD3PMSUI4 PMSUD3PMSUI5 PMSUD3PMSUI6 PMSUD3PMSUI7
  /PRINT INITIAL EXTRACTION
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.
```

Factor Analysis

Communalities

	Initial	Extraction
PMSUD3*PMSUI1	1.000	.918
PMSUD3*PMSUI2	1.000	.930
PMSUD3*PMSUI3	1.000	.965
PMSUD3*PMSUI4	1.000	.949
PMSUD3*PMSUI5	1.000	.971
PMSUD3*PMSUI6	1.000	.967
PMSUD3*PMSUI7	1.000	.954

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.653	95.040	95.040	6.653	95.040	95.040
2	.158	2.257	97.297			
3	.054	.775	98.072			
4	.044	.634	98.706			
5	.043	.611	99.317			
6	.034	.483	99.801			
7	.014	.199	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
PMSUD3*PMSUI1	.958
PMSUD3*PMSUI2	.964
PMSUD3*PMSUI3	.983
PMSUD3*PMSUI4	.974
PMSUD3*PMSUI5	.985
PMSUD3*PMSUI6	.983
PMSUD3*PMSUI7	.977

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

```
FACTOR
  /VARIABLES PMSUD4PMSUI1 PMSUD4PMSUI2 PMSUD4PMSUI3
PMSUD4PMSUI4 PMSUD4PMSUI5 PMSUD4PMSUI6 PMSUD4PMSUI7
  /MISSING LISTWISE
  /ANALYSIS PMSUD4PMSUI1 PMSUD4PMSUI2 PMSUD4PMSUI3
PMSUD4PMSUI4 PMSUD4PMSUI5 PMSUD4PMSUI6 PMSUD4PMSUI7
  /PRINT INITIAL EXTRACTION
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PC
  /ROTATION NOROTATE
  /METHOD=CORRELATION.
```

Factor Analysis

Communalities

	Initial	Extraction
PMSUD4*PMSUI1	1.000	.931
PMSUD4*PMSUI2	1.000	.934
PMSUD4*PMSUI3	1.000	.969
PMSUD4*PMSUI4	1.000	.954
PMSUD4*PMSUI5	1.000	.972
PMSUD4*PMSUI6	1.000	.969
PMSUD4*PMSUI7	1.000	.959

Extraction Method: Principal Component Analysis.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.688	95.545	95.545	6.688	95.545	95.545
2	.144	2.063	97.608			
3	.051	.729	98.337			
4	.039	.560	98.897			
5	.036	.510	99.407			
6	.029	.416	99.823			
7	.012	.177	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix[a]

	Component
	1
PMSUD4*PMSUI1	.965
PMSUD4*PMSUI2	.966
PMSUD4*PMSUI3	.984
PMSUD4*PMSUI4	.977
PMSUD4*PMSUI5	.986
PMSUD4*PMSUI6	.984
PMSUD4*PMSUI7	.979

Extraction Method: Principal Component Analysis.

a. 1 components extracted.