ELECTRONIC HUMAN RESOURCE MANAGEMENT (E-HRM) AND ORGANISATIONAL PERFORMANCE IN BANGLADESH

ABDUL KADAR MUHAMMAD MASUM

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Registration/Matric No : EHA 130013

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ABSTRACT

Electronic human resource management (E-HRM) is one of the strategic tools in organisations to achieve competitive advantage on processes and practices of human resource management (HRM). However, little research has been conducted on E-HRM implementation in developing countries. So, understanding influential factors involved in E-HRM usage at organisational level would be of benefit especially in developing countries such as Bangladesh. In seeking empirical evidence of E-HRM practices and its business implications, a multi-dimensional theoretical model known as the E-VALUE model was introduced. The E-VALUE model assessed the drivers of E-HRM usage by integrating the mature Technology-Organisation-Environment (TOE) framework and recently developed Human-Organisation-Technology (HOT-fit)-fit model to understand this issue. Human characteristic were represented by two independent variables namely senior executives' characteristics and IT expertise of HR personnel. Technological characteristics were represented by four independent variables namely relative advantage, perceived compatibility, perceived complexity, and perceived cost. Organisational characteristics on the other hand, included three independent variables: top management support, organisational culture, and centralisation. Environmental characteristics were represented by competitive pressure and technology vendor support. In looking at the relationship between E-HRM usage and organisational performance, organisational performance was measured based on six non-financial measures i.e., effectiveness, efficiency, development, satisfaction, innovation, and quality. The E-VALUE model also tested the moderating influence of business experience wih E-HRM (in years) on the relationship between E-HRM usage and organisational performance (known as "E-HRM usage – organisational performance" relationship). Besides, the mediating effect of job satisfaction of HR personnel is also examined by measuring job satisfaction of HR personnel because of E-

HRM implementation. The target population of E-HRM adopting companies in Bangladesh was unknown. Therefore, a variety of subsequent sources were utilised to make a complete list of E-HRM adopting companies following guidelines of past research. The questionnaire survey method was used in collecting primary data. Samples yielded 554 usable questionnaires from 138 organisations in Bangladesh. The structural equation modelling method was used to evaluate the model. In assessing the eleven drivers of E-HRM usage, only eight factors such as senior executives' characteristics, IT expertise of HR personnel, perceived compatibility, perceived cost, top management support, organisational culture, centralisation, and competitive pressure were found to have significant influence on E-HRM usage. Next, E-HRM usage was found to have significant influence on organisational performance with positive relationship. Testing the moderator influence, businesss experience with E-HRM (in years), was found to moderate the relationship between E-HRM usage and organisational performance. In addition, in testing the mediation influence, job satisfaction of HR Personnel was found to partially mediate on the above mentioned relationship.This study contributes to the existing body of knowledge by enhancing current understanding of the organisational adoption of E-HRM and its impact on organisational performance, which is an under-researched area in Bangladesh as a developing country. The research results also revealed constructive suggestions to researchers, HR professionals, and the organisations to increase the likelihood of adopting E-HRM.

Keywords: electronic human resource management (E-HRM); human resource management (HRM); job satisfaction of HR Personnel; organisational performance

ABSTRAK

Pengurusan sumber manusia elektronik (E-HRM) merupakan salah satu alat yang strategik dalam organisasi untuk mencapai kelebihan daya saing dalam proses dan amalan pengurusan sumber manusia (HRM). Walau bagaimanapun, kurang penyelidikan dijalankan ke atas pelaksanaan E-HRM di negara-negara membangun. Oleh itu, memahami faktor-faktor penting yang terlibat dalam penggunaan E-HRM di peringkat organisasi akan memberi manfaat kepada organisasi pelaksana. Dalam menyelidik bukti empirikal amalan E-HRM dan implikasi perniagaan, model teori interaktif yang menyeluruh dan pelbagai dimensi dikenali sebagai model E-NILAI diperkenalkan. Model E-NILAI menilai penggunaan E-HRM dengan mengintegrasikan 'Teknologi Organisasi Alam' (TOE) dan yang lebih terkini model 'Teknologi Organisasi Manusia' (HOT) untuk memahami isu ini. Ciri manusia diwakili oleh dua pembolehubah bebas iaitu ciri-ciri eksekutif kanan dan kepakaran sistem maklumat kakitangan HR. Ciri teknologi diwakili empat pembolehubah bebas iaitu kelebihan relatif, keserasian, kerumitan, dan kos. Ciri-ciri organisasi di sisi lain, termasuk tiga pembolehubah bebas: sokongan pengurusan atasan, budaya organisasi, dan pemusatan. Ciri-ciri alam sekitar pula diwakili oleh tekanan persaingan dan teknologi sokongan vendor. Dalam melihat hubungan antara penggunaan E-HRM dan prestasi organisasi, prestasi organisasi diukur berdasarkan enam langkah bukan kewangan iaitu, keberkesanan, kecekapan, pembangunan, kepuasan, inovasi, dan kualiti. Model E-NILAI juga menguji pengaruh pengalaman penggunaan E-HRM (bilangan tahun) sebagai pembolehubah penyederhana terhadap hubungan antara penggunaan E-HRM dan prestasi organisasi (dikenali sebagai hubungan "penggunaan berprestasi"). Selain itu, kesan pengantara kepuasan kerja kakitangan HR juga diukur dengan tahap kepuasan kerja kakitangan HR atas pelaksanaan E-HRM. Populasi organisasi yang menggunakan E-HRM tidak diketahui. Justeru itu, pelbagai sumber digunakan menerusi rangka kerja

penyelidkan yang lepas. Kaedah soal selidik telah digunakan untuk mengumpul data primer. Sampel telah dipilih secara rawak mudah yang menghasilkan 554 soal selidik yang boleh digunakan daripada 138 organisasi di Bangladesh. Kaedah pemodelan persamaan struktur telah digunakan untuk menilai model. Dalam menilai sebelas faktor penggunaan E-HRM, hanya lapan faktor seperti ciri-ciri eksekutif kanan, kepakaran sumber maklumat kakitangan HR, keserasian, kos, sokongan pengurusan atasan, budaya organisasi, pemusatan, dan tekanan persaingan didapati mempunyai pengaruh signifikan ke atas penggunaan E-HRM. Seterusnya, penggunaan E-HRM didapati mempunyai pengaruh positif signifikan ke atas prestasi organisasi. Pengalaman penggunaan E-HRM (dalam bilangan tahun), didapati bertindak sebagai pembolehubah penyederhana antara penggunaan E-HRM dan prestasi organisasi. Di samping itu, dalam menguji hubungan pengantaraan, kepuasan kerja sumber manusia juga didapati memainkan peranan dalam hubungan tersebut. Kajian ini menyumbang kepada peningkatan kefahaman terhadap penggunaan E-HRM dalam organisasi dan kesan prestasi organisasi yang masih kurang diselidik di Bangladesh sebagai sebuah negara membangun. Hasil penyelidikan ini mengemukakan cadangan yang membina kepada para penyelidik, sumber manusia profesional dan pihak organisasi untuk meningkatkan kemungkinan menggunapakai E-HRM.

Keywords: Pengurusan sumber manusia elektronik (E-HRM); pengurusan sumber manusia (HRM); kepuasan kerja kakitangan HR; prestasi organisasi

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CHAPTER 1: INTRODUCTION

1.1 Introduction

This study has chosen Bangladesh as the research setting for its information technology (IT) progression, government's commitment and organisational needs, especially local organisations, to contribute into the nation's economy. Bangladesh is an emerging country, and it has a market-based mixed economy. According to International Monetary Fund (IMF), the economy of Bangladesh is the second fastest rising economy of 2016, with a rate of 7.1%. It is worth mentioning that Bangladesh has achieved better success in human development, with greater life expectancy than India and Pakistan. But, the competition among organisations has accelerated by the rapid business expansion strategies of multinational companies (MNCs) due to globalisation effect. There are several MNCs still running their businesses and newcomers in Bangladesh with state-of-the-art technology, big investment, research and development skills. Now, Bangladeshi local organisations have to compete against those MNCs; thus to survive in the market, local firms need different IT facilities such as electronic human resource management (E-HRM) for better organisational performance.

The contemporary research specifies that research on E-HRM is an important agenda in the context of Bangladesh. Earlier researches indicate E-HRM research is in early stage for Bangladesh setting (Jahan, 2014; Bhuiyan & Rahman, 2013). Most papers discuss simple descriptive statistics and lack robust inferential statistics in these E-HRM research on Bangladesh. However, there are some innovation adoption models based on developed countries (e.g. Roztocki & Weistroffer, 2011). But, the innovation models of developed countries may not be suitable for developing countries. So, as a developing country, exploring a suitable model for E-HRM usage in organisations of Bangladesh is a crucial need. Hence, there is a research gap which should be filled up by critical analytical statistics for others related issues of E-HRM such as broadly discussed

adoption or usage factors, relationship between E-HRM and organisational performance and the consequences of E-HRM usage in the organisations of Bangladesh.

This research particularly targets the unveiling of those factors which are responsible for prompting the decisions that management take to use electronic human resource management (E-HRM) in their organisational performance, and the effect that there is on the organisational operations in Bangladesh based on a proposed E-VALUE model. To add to this, the duration of business experience (in years) with E-HRM was looked into to probe the moderating relationship between E-HRM usage and organisational performance. Furthermore, a mediation impact of the human resource (HR) personnel's job satisfaction was researched as well to determine the mediating function on E-HRM usage-organisational performance relationship.

This, first chapter, provides a synopsis of the thesis. The goal of this chapter is to yield some fundamental information, presenting the setting of the research, elaborating the problem statement, identifying the gaps in the research, and determining the research questions. Also included in this chapter are the descriptions of scope, research significance, and contribution as well as implications of this study. Last but not least, this chapter elaborates the meaning of terms and thesis organisation followed by the summary of the chapter.

1.2 Background of the Study

An effective and efficient human resource management (HRM) endorses that an organisation has the right number of employees along with the essential abilities, skills, knowledge, and experiences, in the right place, at the right time, at a considerable budget, and who are devoted to attaining the present and strategic needs of the administration (Macky & Johnson, 2003). On the contrary, to attain that objective, an adaptation of strategic HRM practices and a firm structure format, to sustain in the

knowledge economy, is required. Experts debate that as a result of globalisation constraints, the global economic system on the whole has transformed from industrial economy to the knowledge-based economy (Jiménez-Zarco, Martínez-Ruiz & González-Benito, 2009). The knowledge is a precious asset of the organisation which enhances the processes in work and promotes a change of the organisational structure to be revamped into a network type (Ruël, Bondarouk & Looise, 2004). Jiménez-Zarco et al. (2009) mentioned that information and communication (ICT) is employed in networked organisations for development of human capital.

The organisational structure is flat in networked environment (Srivastava, 2010). In these types of organisations, the works are completed through team-based approach. It constitutes voluntary contribution, dedication, faithfulness and informal affairs between employees and management (Roberts, 1999). So, traditional HR policies are required to be redesigned to keep pace with the aspects of the networked organisations in the knowledge-based economy. Galanaki and Panayotopoulou (2009) cautioned that companies strongly need to maximise the employees' productivity to confront the obstacles associated with modern day knowledge-based economy. There was also advice, asking organisations to implement information system, specifically E-HRM, for HRM operations. There are many terms designating the HR services with Information Technology (IT): HR Intranet, virtual HR, HR portals, human resource information system (HRIS), computer-based human resource management systems (CHRIS), web-based HR, and electronic human resource management (E-HRM) (Ruël et al., 2004).

E-HRM is at a rudimentary level when it is related to either the HRM strategy literature or general IT literature (Marler & Fisher, 2013). The term E-HRM is selected in this study as a result of its growing attention by scholars and HR managers in settings. Therefore, this research concentrates on the idea of E-HRM usage. E-HRM

promises improved services to the system users of HR department (management and employees). It increases cost effectiveness and work efficiency within the HR department, and involves HR administration to align themselves as a strategic partner in achieving organisational goals (Bondarouk & Ruël, 2013). Usually, HR goals are segregated into three categories: maintaining cost effectiveness, focusing on the tactics of the business, and the upgrade of service for internal customers. The development of worldwide orientation of HRM is a fourth goal included by E-HRM to the aforementioned three categories (Nenwani & Raj, 2013).

E-HRM boosts efficiency and effectiveness in everyday HR tasks. Thus, HR experts can focus on more strategic issues by ensuring more specific HR related decisions (Bian, 2012). It assists organisations to lower costs by bringing down the number of HR staff and raising the overall pace of different HR practices (Yusliza & Ramayah, 2011). In addition, E-HRM has relational influences on organisations. It assures the feasibility to access HR information for employees and managers with enhanced connectivity of all parts of the organisation and external organisations.

Moreover, E-HRM has capabilities to aid organisation's employee empowerment, employability, job satisfaction, retention and the work-life balance by virtue of apparent and clear HR data (Lau & Hooper, 2009). Bondarouk and Ruël (2009) asserted that the current generation is tech-savvy and it is another reason for implementing E-HRM in the organisations. This tech-savvy generation is advancing with IT facilities. At the time of making entry to the labour market, the employees foresee their workstation being employed with IT facilities as they are typically interested to use IT applications.

Because of the above mentioned matters, E-HRM has been recognised as an academic field that combines IT and HRM disciplines. In recent years, E-HRM has brought rising attention to researchers as a new and interesting area of research

(Strohmeier, 2007). However, IT related matters in HRM research are not much structured (Hoobler & Nancy, 2004). Experts claimed that the research area of E-HRM is still in its rudimentary position. The statistical proof to support the role of E-HRM in organisational performance is still limited. The most significant fact is that the E-HRM research endures insufficient theoretical contributions (Strohmeier, 2007). An analysis of the E-HRM literature demonstrates that the focus is specified on the pre and formal undertaking stage of E-HRM, for instance, "intent to E-HRM adopt" (Ankrah & Sokro, 2016; Yusliza & Ramayah, 2011), and "E-HRM adoption" (Bian, 2012; Teo, Lim & Fedric, 2007; Troshani, Jerram & Rao Hill, 2011) instead of the post adoption concerns, for example, "value creations" specifically in developing nations. Researchers mentioned that the post-adoption stage of E-HRM is a vital study field to portray an explicit picture of E-HRM's business value (Ruël & van der Kaap, 2012).

Stressing the adoption and post-adoption stages regarding drivers of E-HRM usage and E-HRM's value creations to organisations, this research intends to find empirical evidence from organisations in Bangladesh. This study exposes respondents' (HR personnel) understanding of the issues influencing E-HRM usage and the consequences of E-HRM usage on organisational performance. In closing the knowledge gaps identified in previous research, a conceptual model is constructed. Moreover, this research experimented the effect of moderating variable (business experience with E-HRM) and mediating variable (job satisfaction of HR personnel) to find out how it changed the E-HRM usage and organisational performance (E-HRM usage - organisational performance) relationship.

1.3 Context of Bangladesh

Bangladesh is the eighth most densely inhabited nation in the world, with an area of 147,570 square kilometres. Its official name is People's Republic of Bangladesh. The

population of Bangladesh is approximated to be around 165 million in 2017. It stands fourth largest in the context of being a nation with largest Muslim inhabitants, only to be behind Indonesia, Pakistan and India. Bangladesh, located in the South Asian Subcontinent, is bordered vastly by India in the North and West, the Bay of Bengal in the south, and Myanmar in the East. The land surface of Bangladesh varies significantly, and is made up of mountains, jungles, lakes, sea along with the possibility of up to six seasons' weather. Bengali (Bangla) is the official language. It is the mother tongue of more than 98% of Bangladeshis. English is widely used in the legal system and tertiary education, and is accepted as the most desired second language among the middle class and rich society. Bangladesh has included Islam as the state religion in the constitution as more than 86% of Bangladeshis are Muslims. The followers of Islam mainly constitute the Sunni, followed by the Shia and Ahmadiya. Among other religious beliefs, Hinduism is popular with 12.2% of the population, Buddhism 0.7%, Christianity 0.5% and others constituting of 0.3%.

Bangladesh, previously known as East Pakistan, gained its independence in 1971 from its parent country, Pakistan. It is a secular and constitutional unitary parliamentary republic nation, with an elected parliament called the Jatiyo Sanshad (National Parliament). Popular votes decide the parliament members every five years. A noteworthy fact is that Bangladesh has attained more success in human development, with higher life expectancy than neighbouring countries of Pakistan and India ("Bangladesh and Development", 2012). This nation continuously deals with challenges of climate change, gender inequality, inconsistent political affairs, and religious disputes. The nation has abundant natural resources, with limestone, coal and natural gas topping the list. Agricultural products such as rice, tea and jute fill the fields.

Bangladesh is an emerging country, and it facilitates a market-based mixed economy. According to IMF, the Bangladesh economy is the second firmest growing economy of 2016, delivering a rate of 7.1%. The per capita income of Bangladesh is at US$3,840 (PPP) and US$1,466 (nominal) in 2016. On the scale of purchasing power parity the per capita income of Bangladesh is US$3,019, making the economy the world's thirty sixth largest economy (Rahman, 2015). To add further, this country has the third largest economy in South Asia after India and Pakistan, and maintains second biggest foreign reserve after India.

The non-government sector in Bangladesh is boosting steeply with many MNCs that run the national economy. The recent years have seen export-oriented industrialisation rise due to exports making up USD 30 billion in FY2014-15 ("Bangladesh Fiscal Trade Deficit", 2015). In the private sector, the IT industry is a substantially developing industry, and it is a comparatively new sector in the economy of Bangladesh. However, IT industry has not been able to make tangible contributions to the country's economy. This sector makes about $300 million revenue every year. In addition, the internet usage rate has impressively gone up by 18.07% in 2012 compared to three years earlier (Chowdhury, 2015). The government of Bangladesh predicts the IT industry to contribute 7.28% to GDP growth by 2021 as a consequence of the rising rate of Internet penetration in the nation (Chowdhury, 2015).

In the age of modernisation, IT is targeted as a "thrust sector" in Bangladesh since it expresses the aptitude for instantaneous gains in transformations, industry growth, employment creation, enhancing governance and providing platform for inclusion, and it has marked influence on the development of other sectors. As a crucial part of the government's vision to prosper the country to an eye-catching height in 2021, the program of "Digital Bangladesh" has been undertaken. It is a pivotal dream of the

country. Therefore, explicit importance is provided on the usage of digital technologies to achieve Vision 2021. This vision commits to the entitlement of the middle-income with peace, prosperity and dignity by the time the country steps into its 50 years of freedom. A number of measures have been adopted by the government to reach the fulfilment of the dream, which is strongly understood to not only transform the country into a knowledge-based contemporary society, but also establish the nation as the world's upcoming IT destination.

As a result of the effort to keep pace with globalisation, competitiveness has rocketed by the substantial commercial expansion policies of multinational companies (MNCs). A good number of multinational companies, including newcomers are still operating their businesses with the latest products of technology, big investment, and research & development skills. At present, Bangladeshi local organisations are having to compete with those MNCs for profit and survival, and in order to maintain their presence in the market, local enterprises have to install state of the art IT facilitations like enterprise resource planning (ERP) system, HRIS, etc. for their business effectiveness.

As a consequence, this research has selected Bangladesh as the subject of research for its progress in the IT sector, state's commitment and organisational requirements, particularly local companies, to assist in the development of the country's economy. In contrast, earlier studies pointed out that research on E-HRM or HRIS is a crucial program in the context of Bangladesh. The present day study depicts that E-HRM research is in the preliminary stage for the environment of Bangladesh (Jahan, 2014). A majority of the papers produce simple descriptive statistics and the lack of robust inferential statistics. These papers include only applications of E-HRM (Chowdhury, Yunus, Bhuiyan & Kabir, 2013; Hossain & Islam, 2015), obstacles to implementing E-HRM (Bhuiyan & Rahman, 2013; Chowdhury et al., 2013; Ferdous, Chowdhury &

Bhuiyan, 2015; Hossain & Islam, 2015; Jahan, 2014) and current status of E-HRM application (Bhuiyan & Rahman, 2013; Hossain & Islam, 2015; Jahan, 2014). Thus, there is a research inadequacy which needs to be closed with vital analytical statistics for other correlated matters of E-HRM such as the vastly cited adoption or usage factors, relationship between E-HRM and organisational performance and so on.

1.4 Problem Statement

While technological innovation and management have consistently been used to gain competitive advantages, the professionalisation of HR practices often lags behind. HR practices often suffer from some supportive tools and techniques in spite of the widely recognised importance of "human capital" for organisational success. It may be due to poor strategic alignment of Information System (IS) with HR processes (Ruël & van der Kaap, 2012). Therefore, traditional HRM practices have been shifted to E-HRM to attain organisational goal.

E-HRM research is partly rooted in HRM research, which is concerned with sociology and psychology, organisational behaviour and organisation studies, and partly rooted in IS research (Ruël & van der Kaap, 2012). Both research streams commonly take the organisational context into consideration. In HRM research streams, the contemporary studies revealed that E-HRM enhances HRM effectiveness in an organisation (Lengnick-Hall & Moritz, 2003), and HRM effectiveness is frequently considered as HRM contribution to organisational performance (Parry, 2011).

In IS research streams, researchers shared contradictory results to express the relationship between IS and organisational performance. Some researchers reported a positive relationship between IS and organisational performance (Banker, Kauffman & Morey, 1990; Lunardi, Becker, Maçada & Dolci 2014; Zhang, 2007), while others found negative relationship between IS and organisational productivity and profitability

(Irani & Love, 2000). According to Laudon and Laudon (2014), there are three main reasons why investments in IT do not always produce positive results: 1) information quality, 2) management filters, and 3) organisational inertia and politics. Moreover, some contemporary studies discovered weak relationships between IT applications usage and organisational performance (Ravichandran, Liu, Han & Hasan, 2009). However, another stream of research found no relationship between IS or IT investments in many firms in different sectors (Dos Santos & Kuzmits, 1997). In a nutshell, previous research that measured the influence of IS on organisational performance revealed unsatisfying results. Therefore, the research interest in the field of IS such as E-HRM is still high and deserves further investigation to resolve the inconsistency (Al-Dmour, 2014).

Realising the benefits of E-HRM, scholars discovered a comprehensive array of potential factors that could influence management decision and implementation for E-HRM in organisations (Bondarouk & Ruël, 2013). The implementation of E-HRM is imperative to the management as it involves large financial investment, and potentially affects organisational processes, structure, policies and performance (Panayotopoulou, Galanaki & Papalexandris, 2010). Thus, it is very important to comprehend the aspects which have an impact on E-HRM adoption and implementation. Earlier studies attest that organisational size is the only constantly accepted factor among the probable factors for E-HRM adoption and implementation (Teo et al., 2007). Scholars debated that the weight of discovered factors and the relative weight of every variable is most possibly distinct together with characteristics of innovation and its country (Al-Dmour, 2014; Wejnert, 2002). Furthermore, researchers firmly state that majority of the outcomes of technology adoption experimentation are continuously changing (Al-Dmour, 2014). Therefore, the understanding of possible factors that affect decision of E-HRM adoption and use in the organisation for individual setting is very crucial.

After successful implementation of new IS, employees will undeniably use it despite their negative beliefs and attitudes towards the system (Maier, Laumer, Eckhardt & Weitzel, 2013). Finally, the organisation fails to achieve its target. Scholars attested that E-HRM changes HR personnel's routine tasks. Hence, they have to adjust with a new workflow (Wiblen, Grant & Dery, 2010). Adapting new workflow needs more work and additional stress to manage the E-HRM (Ngai, Law & Wat, 2008). In addition, less user-friendly feature and difficulties in using cause of employees' incessant disappointment (Beckers & Bsat, 2002). This sensation may also cause decline in employees' work motivation, which consecutively influences job satisfaction in a negative way (Singh, 1998). Thus, HR personnel can perceive lower job satisfaction during or after the implementation of E-HRM (Konradt, Hertel & Schmook, 2003).

Generally, the greater part of E-HRM studies are on developed nations, for example, Canada, the United States of America and Western Europe (Panayotopoulou, Vakola & Galanaki, 2007), while the focus on developing countries are scarce (Roztocki & Weistroffer, 2011). However, comparatively a few studies have been examined on some developing countries such as China, Malaysia, Jordan, etc (Al-Dmour, 2014; Bian, 2012; Teo et al., 2007). But, there is acute shortage of E-HRM research in South Asia, particularly in Bangladesh. Besides, the implementation progress of E-HRM in Bangladesh is in early stage (Jahan, 2014). Researchers argued that most Bangladesh organisations are not conscious of E-HRM in spite of its multitudinous facilities (Chowdhury et al., 2013). However, the trend is progressively changing and organisations are implementing IS for their day-to-day business activities. Likewise, government of Bangladesh has taken distinctive strategic initiatives such as training programs for citizens (specifically young, adults, women and rural people), computer equipment without tax; and strong ICT infrastructure everywhere to assist in creating a digital country.

The concept of technology adoption is considered universal (Wejnert, 2002). But, there are some constraints concerning the aptness of technology adoption models of developed countries when these are introduced to developing countries (Roztocki & Weistroffer, 2011). Bangladesh is exceptionally multifaceted in the context of economy, environment, and usage of technology. Therefore, it is very pivotal to discover the applicability model for E-HRM usage in Bangladesh. Similarly, concrete proof of E-HRM's impact on organisational performance as well as its effect on HR personnel is essential for organisations in Bangladesh for developing strategy and awareness of E-HRM usage and implimentation. So, there is knowledge gap in relation to the likely factors that affect the adoption decision of E-HRM and the impact of E-HRM on organisational performance in developing countries, in particular within Bangladesh's context.

1.5 Research Gaps

Manifold studies are conducted on the E-HRM field, mostly on its importance, usage, pre-adoption, and post-adoption determinants, particularly in developed nations. But, explicit literature survey derived that gaps of knowledge found in few aspects which are as follows:

- The majority of literatures are experimented in western countries which have distinct government approaches, socio-economic, commercial and cultural environments as compared to countries that are developing. A review of earlier studies clarified that E-HRM adoption characteristics is still under-researched and that most of these experimentations have concentrated on the condition of E-HRM usage and other HR applications. Conversely, an insignificant number of studies on the E-HRM adoption are received in Asian context such as China (Bian, 2012) and Singapore (Teo et al., 2007), but unfortunately no study in Bangladesh has been conducted thus far. For

that reason, the research findings would facilitate in narrowing the dearth of literature on drivers of E-HRM usage and its influence on organisational performance of the organisations in Bangladesh.

- The missing of important dimension; human dimension that includes senior executives' characteristics and IT expertise of HR personnel on E-HRM usage decision that could have important influence on E-HRM usage.
- In E-HRM adoption research, researchers incorporated limited variables to examine their influence on E-HRM adoption (Bian, 2012; Teo et al., 2007). Wejnert (2002), however, revealed that earlier studies portray a vast number of aspects that were enlisted in other IS adoption researches, and they have a possibility of significantly influencing the chances of whether an organisation will adopt E-HRM. As a result, there are some noteworthy variables such as senior executives' characteristics (innovativeness and IT knowledge) and organisational culture (as advised in the other IT innovation literature) that are missing in E-HRM research that could profoundly forecast E-HRM adoption.
- There is a lack of moderator effect which can very likely influence the relationship between E-HRM usage and organisational performance.
- There is a deficiency of mediator effect which could have a strong effect on the relationship between E-HRM usage and organisational performance.
- The measurement of organisational performance for E-HRM usage was not found in E-HRM past literature. Earlier studies noted that research on the usage of HRIS or E-HRM and organisational performance is yet to be unveiled (Bhuiyan, Rahman & Gani, 2015). In addition, Marler and Fisher (2013) examined 40 studies connected to the implications of HRIS or E-HRM and organisational performance from between 1999 and 2011, and no empirical proof was discovered on the mentioned relationships.

In closing the gaps mentioned above, the direct and indirect influence of the variables were utilised in this study. On the top of it, it is debated that the relationship between independent and dependent variable might be affected by the presence of moderating and/or mediating variable. There is a belief that performance measurement in a multidimensional theoretical framework necessitated a non-financial perspective from both the technology and HRM perspective. These directed the development of a theoretical model (E-VALUE model) that investigated factors specifying E-HRM usage on organisational performance. As a consequence, E-VALUE model is proposed by utilising Technology-Organisation-Environment (TOE) framework, Human-Organisation-Technology (HOT-fit)-fit model, evolutionary game theory, technology acceptance model (TAM), and resource-based view (RBV) theory for statistical evidence on factors identifying E-HRM usage on organisational performance to be effective for technological innovation of performance measurement.

1.6 Research Questions

With regard to the problem statement discussed in the earlier section, the research attempted to statistically examine the factors identifying E-HRM usage on organisational performance of organisations in Bangladesh. This study also includes the consequences of E-HRM usage in the organisations.

Realising the benefits of E-HRM usage, scholars discovered a broad array of important factors for E-HRM usage (Al-Dmour, 2014). But, the weight of discovered factors and the relative weight of each variable may be varied along with technology adoption features and its setting (Wejnert, 2002; Strohmeier, 2007). Therefore, it is very important to understand the important factors that influence decision of E-HRM usage in the organisations for a particular setting like Bangladesh.

In technology research stream, scholars shared inconsistent results to express the relationship between IT application usage and organisational performance. Some were reported to have positive relationships, weak relationships, or even no relationship, while others found negative relationship between IT application usage and organisational performance. So, E-HRM as a subcategory of IT applications, and the relationship between E-HRM usage and organisational performance should be explored in a particular setting.

However, after successful implementation of new information system, sometimes, the organisation fails to attain its goal. Scholars attested that E-HRM implementation changes the function as well as the work routines of an HR employee. In cases where an employee dislikes these changes, one evaluates the E-HRM negatively. Consequently, it influences job satisfaction of HR personnel. Therefore, organisational performance is hampered. This is the reason Weill (1992) suspected that technology impact on organisational performance may be mediated through another variable. So, job satisfaction of HR personnel is considered as a mediating variable on the relationship between E-HRM usage and organisational performance.

Researchers attested that organisations come to realise the success factors of any innovation adoption through exploration, market examination, and experimentation and learnt from competitors' experience (Kauffman et al., 2002). Consequently, for E-HRM implementation in organisations of Bangladesh, the trial and error process experienced by an organisation would be advantageous for gaining experience on what strategies paid off and what did not. Therefore, a moderating variable (business experience with E-HRM) is proposed to explore the effect of the variable on the relationship between E-HRM usage and organisational performance in context of Bangladesh.

Therefore, below are the aforementioned research questions in this study:

1. What are the factors that influence E-HRM usage in organisations?
2. Is there an association between E-HRM usage and organisational performance?
3. How does HR personnel's job satisfaction mediate the relationship between E-HRM usage and organisational performance?
4. How does business experience with E-HRM (measured in number of years) moderate the relationship between E-HRM usage and organisational performance?

1.7 Research Objectives

The main objective of this research is to discover the factors that have influence on the management decisions to E-HRM usage at organisational level and its impact on organisational performance in Bangladesh. The current study ventures to give answers to the preceding questions through attaining the following specific research objectives:

1. To explore the factors influencing the usage of E-HRM among organisations in Bangladesh.
2. To investigate the association between E-HRM usage and organisational performance.
3. To determine whether 'job satisfaction of HR personnel' mediates the relationship between E-HRM usage and organisational performance.
4. To examine whether 'business experience with E-HRM' (measured in number of years) moderates the relationship between E-HRM usage and organisational performance.

1.8 Scope of the Study

This research is confined to organisations in Bangladesh that had set up at least four modules or applications of E-HRM within the last three years. The limitation convinced all participating organisations who are experienced with E-HRM applications.

Therefore, it was possible to clarify the influence of E-HRM on organisational performance. The targeted organisations of this study include organisations from different types of industries, for example, manufacturing (Agricultural equipment and products, Basic Iron and Steel, Consumer Products, Cement, Ceramics, Electronics, Food and Beverages, Glass Products, Home Appliances, Pharmaceuticals, and Telecommunication Equipment) and the Service sector (Banks, Engineering and Construction, Hospitals, Telecommunications and Universities). However, this study did not differentiate between the targeted organisations related to their industry type (e.g. manufacturing and service), organisation size (e.g., small, medium, and large), their ownership type (e.g. public, private, etc.), and E-HRM software (ORACLE-HRMS, SAP HR, etc.) as the number of E-HRM utilising organisations is limited.

1.9 Significance of the Study

The significance of the study is drawn through a number of issues. To begin with, on the basis of an extremely thorough literature evaluation, this study is the first attempt in Bangladesh and one of the few attempts undertaken in South Asia to identify the main factors of the E-HRM usage at organisation level and its impact on organisational performance. The contemporary research on E-HRM in South Asia region exhibits that little research was carried out thus far. As an example, investigation on the necessity of E-HRM, status of E-HRM applications, role of E-HRM were conducted on Indian organisations (Gupta & Saxena, 2013; Kundu & Kadian, 2012; Srivastava, 2010). Furthermore, some studies in Pakistan reveal the adoption of HRIS in Telecommunication Sector of Pakistan (Hanif et al., 2014), the impact of adopting HRIS on three types of HRM practice (Saleem, 2012) and E-HRM use in the health sector of Pakistan (Kumar et al., 2013).

Second, there is insufficienct research on E-HRM in developing nations. The limited understanding of the factors that influence E-HRM use is the motivation for the present study. Hence, farther research might give us the explicit picture of E-HRM, and can widen our acknowledgment of the factors of E-HRM usage and its effect on organisational performance especially in developing countries.

The third essence of the research is that, E-HRM and similar IS applications are changing rapidly (Pairat & Jungthirapanich, 2005). Researchers confirmed that the ERP and similar IS such as E-HRM are going through rapid modifications with time and proposing new difficulties (Plant & Willcocks, 2007). As a consequence, it is fundamentally suggested to allow continuous research on E-HRM adoption, implementation, usage and its impact on organisations. Similarly, the empirical evidences from different settings will make it imperative regards to the adoption or use of E-HRM.

Fourthly, the influence of globalisation and technology advancement are endlessly reshaping the financial strength of a country, and undoubtedly Bangladesh is not an exception. In addition, researchers strongly supported that modern technology has a sizeable influence on today's globalised market structure (Al-Dmour, 2014). To face the globalisation effect, the government of Bangladesh undertook a large number of projects related to ICT for digitisation of information, and a number of these have already started (Rahman, 2015). Moreover, government is putting emphasis on using different applications of digital technologies in both public and private sector (Rahman, 2015). Therefore, a wide usage of E-HRM applications may transform a digital Bangladesh into a reality.

Fifth, the IS vendors are putting their effort to cover their market to firms in emerging countries (Dezdar, 2011). Researchers mentioned that IS projects such as ERP

systems (where E-HRM is considered a module) have to face further obstacles in emerging countries (Huang & Palvia, 2001). Experts stated that Asian companies tackle noteworthy different problems in comparison to the problems faced by firms in developed countries. This is because of the lack of similarity in their environment or nationwide differences, such as business model, management style, and the level of IT usage and so on (Ngai et al., 2008). However, most IT adoption research in Asian context takes place in China (Dezdar, 2011). Hence, research on ERP or likewise IS project (e.g., E-HRM) is insufficient in other Asian regions, especially in the South Asian sub-continent.

Last but not least, Bangladeshi firms started to use different types of IS applications due to government initiatives and strategies, increasing local competition and to some extent owing to the increased foreign competition. Despite the E-HRM concept being initiated since the 1990s, there is acute lack of study in Bangladesh. Therefore, the results of current study clearly identify the potential for E-HRM usage and the consequence of E-HRM usage in the Bangladeshi environment. This original research examines a field in Bangladesh that is yet to be discovered.

1.10 Contributions and Implications of the Study

This study investigates the E-HRM usage in organisations of Bangladesh. This research is expected to bring out empirical evidence on factors identifying E-HRM usage and the impact of E-HRM on organisational performance. To be more specific, it explores the factors that identify the usage of E-HRM and the influence of E-HRM usage on business value (i.e.: organisational performance) after considering the period in which E-HRM (business experience with E-HRM) has been used as a moderating variable. Moreover, job satisfaction of HR personnel is investigated as being a mediating variable between the relationship of E-HRM usage and organisational

performance. These variables are further reviewed in Chapter 2. The empirical and methodological contribution and potential implications of this study are described below:

- The development of a multidimensional E-VALUE model for E-HRM that examines the aspects of E-HRM usage at the organisational level constitutes a significant methodological contribution to previous knowledge. These factors are categorised under four dimensions, i.e. human, technological, organisational and environmental. These dimensions were proposed combining two IT adoption theories, i.e. TOE framework and HOT-fit model.
- An integrated conceptual framework as an E-VALUE model is proposed for the variables that form the basis for the procedure of an organisation's E-HRM adoption or usage, and measured the impact of E-HRM usage on organisational performance. This study aims to investigate the following: firstly, it identifies factors of E-HRM usage in HRM, and evaluates the effects that these have. Secondly, the effect of E-HRM usage on organisational performance is measured. The empirical evidence of this study shows that E-HRM usage has a strong effect on organisational performance, and that it affects this in a positive way. Again, post implementation effect of E-HRM was investigated by a mediating variable - job satisfaction of HR personnel. As expected, the empirical evidence shows the partial mediating effect of mediating variable on "E-HRM usage-organisational performance" relationship. Finally, the moderating effect of business experience with E-HRM (in years) on "E-HRM usage-organisational performance" relationship is examined. The empirical evidence confirms the moderating influence of business experience with E-HRM (in years) on "E-HRM usage-organisational performance" relationship.
- This study's findings can be used by top management with regards to decision-making about adopting E-HRM technology. Additionally, for modern businesses,

the study can help to build HR divisions as strategically relevant sections of contemporary businesses and can enable HR managers in Bangladesh to confidently adopt E-HRM applications (different modules).

- Research findings would be advantageous for traditional human resource management practices to start considering investment in E-HRM applications.
- The research could be helpful for academics in assessing the relationship between E-HRM applications and their impact on organisational performance within the context of developing countries, particularly South Asia.
- The research findings can be used by various related bodies, such as the government, the Ministry of Planning, the Ministry of Posts, Telecommunications & Information Technology, the Ministry of Sciences & Technology in order to further enhance their ICT policies, strengthen the ICT regulatory framework and cyber laws, and promoting the secure and user friendly ICT environment to the organisations of Bangladesh, these bodies should evaluate the outcomes of this research.
- To researchers in Bangladesh and other developing countries, the findings and outcomes of this study will be beneficial. In this study, the connection between E-HRM applications and the value of such practices developes a research framework that can be applied in other developing countries including Malaysia.

1.11 Structure of this Thesis

This thesis is structured into five chapters along with references and appendices. The thesis outline is as follows:

Chapter 1: Introduction

Chapter 1 includes general information and justification for the study on E-HRM in the context of Bangladesh. Specifically, this part describes the reasoning of this setting and the theoretical research background. This chapter presents the problem statement while clarifying why the problem is a genuine area that is worthy of being explored. The explored research gaps are highlighted. Next, the corresponding research questions and research objectives are delineated. The research boundary is also explained. Additionally, the significance of this research and the contributions with implications arising from this research is described. The definition of variables and essential terms are mentioned in the definition of terms' section. Last but not least, an outline of the thesis is briefly mentioned following a chapter summary.

Chapter 2: Review of Literature

Chapter 2 provides a broad depiction of E-HRM, including the definition of E-HRM, the differentiation between HRIS and E-HRM, different E-HRM applications used in organisations and E-HRM research trends in Bangladesh. This chapter also includes conceptualisation and operationalisation of organisational performance and type of performance measures. By examining both online as well as offline resources, an extensive literature review has been carried out. The review includes articles, documents, journals, reports and websites. The literature review has brought about information regarding previous theories and older theoretical models regarding diffusion and value creation of E-HRM. By means of this extensive literature review,

knowledge gaps are identified. Closing the gaps, a conceptual framework has been created that is based on TOE framework, HOT-fit model, TAM theory, evolutionary game theory, and resource-based view (RBV) theory.

Chapter 3: Research Design and Methodology

Chapter 3 details the research design of the study. The target population and sampling procedures are described. Next, a multidimensional E-VALUE model is outlined that explained the factors that influenced E-HRM usage; more specifically on how level of E-HRM usage influence organisational performance and HR personnel. This is based on an examination of earlier research and the objectives of the current study. This chapter will also touch upon the measurement of variables and hypotheses development as well as the operational definitions. Additionally, the content of the questionnaire that is developed for this study is explained. Furthermore, through expert judgement and pilot testing, the validity and reliability assessment of the questionnaire are described. The actions that were taken to distribute the questionnaire and to collect the results are also explained in this chapter. In the final part, the techniques that were used to analyse the results are discussed.

Chapter 4: Data Analysis

Different types of statistical tools and techniques for data analysis are described in chapter 4. Firstly, the gathered data is organised for analysis. Following this, a variety of descriptive statistics, with frequency distribution, measures of central tendencies and dispersion of variables are described. Exploratory factor analysis was employed to reduce the data by creating an entirely new set of variables, which replace and represent the original items/questions. Next, two steps are being used that will examine the data by means of the structural equation modelling (SEM) technique: the measurement

model and the structural model. The results are weighed by means of a number of goodness-of-fit measures. Furthermore, a discussion of confirmatory factor analysis, convergent validity and discriminant validity follows. Finally, the hypotheses are tested.

Chapter 5: Discussion and Conclusion

Chapter 5 includes discussion and conclusion. This chapter presents the key findings of the study and also contains a brief discussion on statistical techniques. The new information as discovered by this study is then compared with the results of similar previous research. The empirical as well as methodological contributions and potential managerial implications are presented. Some of the limitations of the current research are also discussed. Finally, for future research, a number of additional areas of study that may be valuable to build based on this research are recommended.

1.12 Chapter Summary

This opening chapter describes the background of the study as well as the rationale of study, its resulting research questions and specific research objectives. A justification was provided for conducting the academic thesis in the context of Bangladesh – a South Asian developing economy. Moreover, this chapter also included some research gaps. Significance contribution to the new knowledge has been described. A brief thesis organisation is also included in this chapter. The next chapter is arranged for comprehensive information about the theoretical background which guides the development of conceptual model for this research.

CHAPTER 2: REVIEW OF LITERATURE

2.1 Overview

The previous chapter discussed the problem, aim, and setting of the research, as well as the questions and objectives, scope of the research, contribution of the present study, along with its significance. This chapter consists of thirteen sections which discuss and present earlier empirical studies relating to the implementation of E-HRM and the impact it has on organisational performance. Section 2.2 highlights the definition of E-HRM. Sections 2.3 and 2.4 describe the basic dissimilarities between the E-HRM and HRIS as well as the E-HRM applications used by organisations in Bangladesh, respectively. This section is followed by a discussion on the current E-HRM research trends in Bangladesh in section 2.5. In section six, conceptualisation and operationalisation of organisational performance and different types of performance measures are elaborated upon. The next section (2.7) presents a concise breakdown concerning the association between E-HRM usage, value creation and organisational performance. Subsequently, section 2.8 states some prominent IT adoption theories. A comprehensive related literature review on IT adoption, including E-HRM, is discussed in section 2.9. The following section (2.10) represents evolutionary game theory and RBV theory to investigate the relation between E-HRM usage and value creation. In section 2.11, all theories as applied in this study, as well as related IT adoption literature are summarised. Finally, a conceptual model is developed by innovating six theories and model, i.e., TOE Framework, HOT-fit model, RBV theory, TAM, and evolutionary game theory. Lastly, the chapter features a summary section.

2.2 Electronic Human Resource Management (E-HRM)

At the start of the 1990s, the concept of E-HRM was coined by scholars. Many definitions related to E-HRM have been proposed since the early studies integrated two disciplines, i.e. IS and HRM (Bondarouk & Ruël, 2009). There are also several similar

terms around E-HRM. Besides, researchers interchangeably used these terms that can be found from many researches, such as virtual HR (Lepak & Snell, 1998), HRIS (DeSanctis, 1986; Haines & Petit, 1997), intranet-based HRM (Bondarouk & Ruël, 2009), web-based HRM (Ruël et al., 2004), HRM e-service (Ehrhart & Chung-Herrera, 2008), HRIT (Morley, Florkowski & Olivas-Luján, 2006), and business-to-employee system B2E (Harris, Phifer & Berg, 2002). In this study, the term E-HRM is used for its broader aspect of HRM than other similar terms (Ruël et al., 2004).

E-HRM refers to any type of HR activities, which can be either administrative or transformational, as long as they can be supported by IS. It is an electronic way to support HR practices, which can be done by intranet, internet or an ERP system (Panayotopoulou et al., 2007). Consistent with prior research, Laudon and Laudon (2014) defined E-HRM as being a provider of administrative support for HR functions in an organisation through IS. Other researchers have expanded the definition of E-HRM. Lepak and Snell (1998) described E-HRM as a web-based structure mediated by IS to assist organisations in obtaining, deploying and improving the talented human capital. Similarly, Strohmeier (2007) defined that E-HRM is using IT-applications for supporting and networking of at least two self-standing or collective agents in their joint HR duties.

Bondarouk and Ruël (2009) provides the most exhaustive and broadest definition of E-HRM. They classified all probable integration mechanisms and contents in the midst of the HRM and Information Technologies as falling under the umbrella term E-HRM. This is utilised for the creation of value within and across organisations for management and specific employees. Furthermore, some researchers asserted that E-HRM is a web-based system that is developed to implement HR policies, practices, and tactics in order to achieve the organisation goals (Ruël et al., 2004). Explaining the earlier definition,

Olivas-Lujan, Ramirez and Zapata-Cantu (2007) revealed that E-HRM allows workforces and managers to have direct access to HR activities, which can include as record keeping, reporting, team management, internal and external communication, performance appraisal, knowledge management, and other HR related administrative tasks through IT applications. Originally, Watson Wyatt - a consultancy company - developed this definition, and the widely used term 'E-HR' is copyrighted by this company (Morley et al., 2006). Hence, researchers have not reached a consensus on the definition of E-HRM.

Based on the above, it becomes clear, that researchers interchangeably use E-HRM and similar terms, though there are some basic differences among these terms. In adopting the perspective that underlies the definitions that exist in the literature on the emerging E-HRM, authors bear these challenges in mind. In this perspective, IT is a physical entity such as hardware, software and communication network infrastructure. Even if separated from people, IT still incorporates organisational processes like HR activities. In the current study, E-HRM refers to computer hardware and software, as well as resources for electronic networking enabling that are either HRM activities intended or actual (for example, policies, practices and services) by interactions that are both in the self-standing and group-level both within as well as across the organisational borders.

2.3 The Difference of HRIS and E-HRM

Some may think that the adoption of HRIS is equivalent to the adoption of E-HRM. However, there is a differentiation between the term HRIS and E-HRM. Since its inception, E-HRM has often been considered as HRIS. According to Walker (1993), HRIS is a systematic process utilised in collecting, retrieving, storing, maintaining, and validating data, which is vital for an organisation with regards to its organisation unit

characteristics, personnel activities, and overall human resources. He added that it is usually a collection of databases that create a large record of all worker matters within an organisation. According to DeSanctis (1986), HRIS was initially meant for supporting the administration, planning, and decision-making, as well as control of the HRM activities; and acted as an individualised IS in the organisation's traditional functional scope. In supporting this opinion, Haines and Petit (1997) considered HRIS as a system applied within an organisation to obtain, store, manage, analyse, search and distribute HR information.

After extensive literature review, it has been found that there are some basic differences between HRIS and E-HRM, though some researchers use the definitions interchangeably. Firstly, HRIS denotes the automation of some IS applications for the sole assistance of the HR function, whereas E-HRM refers to the IS applications for HR activities through internet, intranet or extranet, and more recently wireless communications technologies. E-HRM hereby changes the nature of interactions among HR personnel, line managers and employees into a more digitalised one, hereby transitioning away from the traditional face-to-face relationship (Bian, 2012). Nevertheless, some researchers used the term HRIS when actually denoting E-HRM in their published articles, e.g., Troshani et al. (2011); Maier et al. (2013). On this issue, Ruël et al. (2004) proclaimed that some authors write on HRIS but they cross the divide with E-HRM when they begin developing their thoughts. Secondly, HRIS is attuned towards the HR department, which serves the managers and staff within HR department. On the other hand, it can be said that not only HR personnel but also general employees can use E-HRM for their HR related activites (Grant & Newell, 2013). The management outside of the HR department is also actively involved in the E-HRM application (Ruël et al., 2004). The following will elaborate upon how IT supports and effectively improves HRM practices.

Nowadays, researchers take HRIS as an E-HRM component extending to include internet-based IT. Nonetheless, E-HRM forms a wider construct in the sense of being also available for persons beyond the HR department within an organisation (Marler & Fisher, 2013).

2.4 E-HRM Applications in Organisations

With the increasingly widespread use of internet technology, the IT application of internet is increasingly becoming an essential issue in HRM research. Dos Santos and Kuzmits (1997) argued that HR professionals should consider the benefits of using the internet, which can reduce communication costs and can improve internal and external communication as well as information management. Teo, Soon and Fedric (2001) suggested that the application of intranet can also contribute to HRM transactions like database access, information retrieval, etc. Also, these methods can create a streamlined path for employers in offering information to their workers. Various researches have pointed out several useful uses of internet and IT based applications for HRM activities, and some of these are currently applied into HRM practices. According to Al-Dmour (2014), the basic E-HRM modules are the employee recruitment module, record keeping module, benefits module, job evaluation module, career development module, payroll module, tax module, safety module, training module, employee self-service module and as well as the labour relations module. Sometimes, more than one module creates a composite module. Generally, the number and nature of a module depends on user specifications or vendor software developments. Based on current usage of E-HRM applications in sample organisations in Bangladesh, the literature summary of E-HRM applications is shown in Table 2.1.

Table 2.1: Literature Summary of E-HRM Applications

E-HRM Applications	References
(a) Recruitment and selection	Teo et al. (2001); Dineen, Ash and Noe (2002); Pollitt (2004); Kundu and Kadian (2012); Bian (2012); Al-Dmour (2014)
(b) Training and development	Marquardt (1996); Teo et al. (2001); Long and Smith (2004); Kundu and Kadian (2012); Bian (2012); Al-Dmour (2014)
(c) Payroll, benefits and Compensation management	Teo et al. (2001); Payton (2003); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
(d) Performance appraisal	Teo et al. (2001); Gueutal et al. (2009); Kundu and Kadian (2012); Bian (2012); Al-Dmour (2014)
(e) HR planning	Walker (1993); Teo et al. (2001); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
(f) Internal and External communication	Dos Santos and Kuzmits (1997); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
(g) Employee self-service portal	O'Connell (1996); Roberts (1999); Hendrickson (2003); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)

2.4.1 Recruitment and Selection

Bian (2012) pointed out that online recruiting is becoming a big trend for HR functions. In recent years, more and more companies have begun to adopt online channels to recruit employees which has changed employment practices for both job seekers as well as companies. Job seekers can deliver their e-resume through internet to recruitment pages or company websites. When vacancies open in an organisation, department managers can type in recruitment applications online, and at the same time the company's IS will automatically extract the employment conditions, main duties and other requirements from job descriptions as listed in the personnel database, which can then be modified and confirmed. After the recruitment application has been approved, the system can immediately release the online job information. The job candidates' e-resume can be scanned by companies online, so that they can identify their education background, required skills and work experience. The relevant information can then be

transferred into the candidate database of the E-HRM system of the organisation for current or future use. Meanwhile, the whole process in relation to recruitment management can be finalised on the network, which includes the identification of a candidate, the interviewers, interview time and place, interview questions, interview evaluation form, etc. Once a candidate is hired, their basic information will directly transfer from the candidate database into the company's employee repository, which is a digital method of recruitment.

2.4.2 Training and Development

A number of HRM studies have pointed out the importance of the internet and IT applications for supporting organisations' worker training and development (Al-Dmour, 2014; Long & Smith, 2004). As a unique product, the learning management system (LMS), gives HR the ability of tracking employee development, as well as educational information. It also provides information about how skills can be further developed, and points out what courses, books, web-based learning or other materials can be used for the employee to acquire these skills. Additionally, the system allows for these courses to be offered on specific dates, and can map the delegates and training resources that are being used. The complex LMS enables the managers to make approvals of new training practices, schedules and budgets as well as review performance management and appraisal metrics.

The web-based training (WBT) is a widely known method utilised for distance learning, through which employees can take part in relevant and time-place independent training programs offered by their organisations (Bian, 2012). Kundu and Kadian (2012) emphasised that the Web-based HRIS is a self-service system, convenient for both the employees and managers for online communication. When an employee selects a training course, they can see some of other information related to this course, like the

cost, required number of trainees, course outline, location, as well as condition schedule and so on (Long & Smith, 2004). Additionally, employees are able to view their training history, which if needed can be deleted. Besides, evaluation of the effectiveness of training is documented through the network after an online training.

2.4.3 Payroll, Benefits and Compensation Management

Bian (2012) pointed out that a number of companies have been moving their HRM activities to the web in order to improve HR efficiency, including the pay and benefits service, such as record keeping, salary calculation, etc. The E-HRM provides a framework that allows employees to access immediate information about the breakdown of pays and corporate accounts. Firms collect data about salary, wages, and benefits for streamlining information towards the payroll, benefits and compensation application online. Web technology provides employees a real-time self-check function to understand monthly as well as historical details of pay and other financial benefits (Ngai et al., 2008).

The payroll module provides an automation of the distribution of funds through gathering data concerning employee time and attendance by performing calculations on deductions and taxes as well as generation of periodic pay cheques and workers' tax reports. In E-HRM, the payroll staff member is only required to enter the timesheets (which may not even be necessary for companies that use an online time log integrated with the E-HRM), after which the system will go through various steps to generate related calculations in entirety for the employer. Sometimes, the payroll module also provides employee benefit related services. It gives a framework for firms for administering and tracking the participation of employees in the benefit programs. In general, they include insurance, retirement benefits, profit sharing, flexible benefits, stock purchase option and so on.

The compensation module typically encompasses insurance, compensation, profit sharing and retirement. The process requires gathering and administration of several layers of information, especially pertaining to accidents or sickness, medical reports, the individuals implicated, regulations that govern staff behaviour, government information, etc (Hendrickson, 2003).

2.4.4 Performance Appraisal

Facilitating in the process of performance evaluations, research has shown online performance appraisal system software programs to be expedient managerial self-service (MSS) and employee self-service (ESS) tools (Bian, 2012). For starters, online performance appraisal systems can be used in conjunction with employee position description modules, giving managers the ability to collate data on general responsibilities, functions, and qualifications of a position, together with information pulled from the evaluation (Gueutal et al., 2009). In addition, its archival capabilities allow managers to preserve past evaluations, allowing them to compare and contrast employees' development over long periods of time (Kundu & Kadian, 2012). At the administrative level, these systems allow human resource managers to monitor the length of time it takes supervisors to complete employee performance appraisals, as well as draw conclusions regarding performance ratings, trends, and efficacy of the position itself.

2.4.5 HR Planning

There are two steps in the HR Planning system: first, assessing the current state of human resources as well as being able to meet future needs for human resource. This assists HR managers in ensuring adequate staffing. Teo et al. (2001) described that effective HR planning can be defined as the process that assigns the right competent employee to the right job at the right time. HR managers are using the internet in

supporting HRM because the online world is vital for HR managers in achieving their business goals (Walker, 1993). The technological developments form the reasons for which HR practitioners have better tools for monitoring the workforce, producing reports, and utilising employee skills effectively, as well as reducing labour costs.

2.4.6 Internal and External Communication

Many internal communication channels use web-based technology. These include an in-house staff bulletin board, personalised web page, forum, and chat rooms as well as management email. Moreover, E-HRM, through the internet and intranets, are effective avenues for organisations that can facilitate internal and external communication. Regarding internal communication, staff from all levels of management can contact each other directly. By connecting to the internet, they can access relevant and real-time information. Externally, workers can connect and share information across different branches, including international ones (Al-Dmour, 2014).

2.4.7 Employee Self-service

The applications of Employee Self Service (ESS) have caught the attention of HR managers in recent years. As such, these HR applications are internet-based giving the employees the ability of viewing and/or editing information in their HR employee file. Besides, employees have the ability of updating their emergency and personal contact information and changing their addresses whenever need arises. Hendrickson (2003) revealed that employees are able to update their data and records by themselves using the self- service portal; they have the ability of choosing employee benefits and transfer funds, checking the balances of their salary accounts, and setting personal performance plans and so forth. Additionally, Bian (2012) indicated that a web portal has the ability of improving the communication amidst managers and employees, because both parties have the ability to initiate conversation.

2.5 Software Used in the Organisations of Bangladesh

In Bangladesh, different types of HR management software are used in organisations to accomplish HR activities. Usually, the large scale organisations use international vendor HR software for HR management purposes. These are ORACLE-HRMS, SAP HR, PEOPLESOFT, ABS (Atlas Business Solutions), ABRA SUITE, SPECTRUM HR, CORT: HRMS, Human Resource Microsystems, HRSOFT, and VANTAGE: HRA. Besides the above mentioned HR software, some organisations use their own customised HRIS software like Biotech HRM system, Basel ii, E-views, ERP solution, Flex cube, Frontiers, PIMS, etc. for HR management purpose.

2.6 E-HRM Research Trends in Bangladesh

The idea of HRM in Bangladesh was mainly introduced by multinational corporations during the mid-90 (Bhuiyan & Rahman, 2013). A few national organisations, including Bangladesh Bank, (a central bank of Bangladesh), also modernised their personnel management practices. Several public and private universities currently offer courses concerning HRM in Bangladesh. This trend demonstrates the new strategic role of HRM in achieving company goals in Bangladesh.

Initially, most organisations in Bangladesh executed their HRM practices manually. The country is emerging as a fertile country to adopt and adapt changing technology. Firms are more likely than ever before to invest in competition-neutralising information and technological systems. As a means of maximising efficiency and minimising the cost of human resources, HRIS is gaining popularity among practitioners in Bangladesh (Islam & Al Mamun, 2016).

Bhuiyan and Rahman (2013) surveyed sixty HR executives from different manufacturing and service sectors of Bangladesh. The results show that organisations from both these sectors in Bangladesh have very strong needs in using HRIS. The study

concluded that firms are more oriented by their routine as opposed to by their strategy. They explored nine factors, i.e. lack of commitment from management, status quo satisfaction, no or poorly conducted needs analysis, failure of including crucial individuals, failure of keeping project team intact, politics/hidden agendas, deficiency in communication, and bad timing blocking the success of HRIS utilisation in Bangladesh's manufacturing and service organisations.

A recent study conducted by Chowdhury et al. (2013) showed that HRIS is currently utilised by banks in Bangladesh in three distinct areas: a) Recruitment and selection b) Training and Development c) Payroll. Amidst the various areas of uses of HRIS in the HRM process, respondents said that they valued recruitment and selection, which is 98.28% (33 out of 35). They identified payroll as the HRIS's second area benefiting the firm with approximately 82.86%. There was a mixed response to the role of HRIS in saving time. The survey gives a revelation that HRIS plays a vital role in saving costs beneficial to record keeping, with about 86.7%. The primary barriers against the HRIS usage are the ability of HRIS to monitor nepotism, unemployment threats, and privacy problems.

Similarly, Jahan (2014) stated that the lack of attention from management, the fear of high costs, lack of experience, and lack of training on E-HRM were the main obstacles to implementing E-HRM. But the advantages of the E-HRM weigh more than these obstacles. She also stated that if E-HRM becomes more common in Bangladesh firms, managers and employees will start to use the systems. Still, the implementation of E-HRM remains a challenging task in Bangladesh. Similarly, Ferdous et al. (2015) found that management reluctance, employee privacy issues, organisational internal resistance, and conversion cost are other potential objections that impede the effective implementation of HRIS in the organisations in Bangladesh.

With that same train of thought, Hossain and Islam (2015) conducted a research on 22 servicing firms of Bangladesh and revealed that most of the organisations have just started using the E-HRM within a limited scope for salary, payroll administrations, leave records, attendance time process employee database, and information as a whole where all other core functions of HRM yet not come in front line. In addition, the real optimisation of human resources functions converting from manual to online system have yet not been taken in right shape & standard, as all other key function has not yet been implemented by organisations. The authors also stated that one of the major reasons is that employees feel that it is time consuming, does not have enough expertise and of course there is psychological resistance to change. Cost factors and a lack of organisational learning also form prime concerns.

A study on students' behavioural intention and acceptance of e-recruitment systems conducted by Khanam, Uddin and Mahfuz (2015) found that facilitating conditions and self-efficacy have significant influence on behaviour intention. Also, behaviour intention showed positive influence towards using an e-recruitment system. Their results showed that self-efficacy plays a significant role in influencing e-recruitment system usage as compared to other external factors. Next, Hosain, Ullah and Khudri (2016) investigated the impact of e-recruitment on the attitude of graduate jobseekers in Bangladesh. The study reveals that internet is the most preferred source to search job. It also shows that the effectiveness of e-recruitment largely depends upon advertisement placements. With this, perceived advantages and usability can be put forward, which both greatly impact the likelihood of a candidate to apply.

A contemporary study on both local and foreign 100 manufacturing and servicing firms conducted by Islam and Al Mamun (2016) revealed that 54% of respondents reported that HRIS makes their organisations more cost-efficient by producing

customised information at the right time to the right people in the right form. All these factors contribute to the operational efficiency within an organisation. Moreover, 57% of respondents indicated that HRIS reduces bureaucratic procedures, strengthens managerial capability, smoothens the decision making process, and communicates better to employees. Thus, HRIS accelerates managerial effectiveness. On the other hand, 70% of respondents indicate that HRIS is an enabling system, highlighting HR as core competency. The authors concluded that adoption and outcomes are not associated with managerial experiences or gender, but are related to the location of the company.

The above discussion indicates that research on E-HRM or HRIS is important for the research agenda in Bangladesh. Most of papers represent simple descriptive statistics and lack robust inferential statistics. These papers incorporate only applications of E-HRM, implementation barriers and current status of E-HRM applications. Hence, there is a research gap which should be filled up by critical analytical statistics for others related issues of E-HRM, such as broadly discussed adoption or usage factors, relationship between E-HRM and organisational performance and so forth.

2.7 Organisational Performance

Organisational performance has prevailed as the greatest imperative standard in appraising organisation's functioning; but, scholars usually devote scant attention to the actual meaning of performance and how to effectively measure it (Hong et al., 2012). The determination of organisational performance can be done through measuring the actual output or results of an organisation versus its objectives and goals. According to Richard, Devinney, Yip and Johnson (2009), performance in an organisation incorporates three critical parts of the outcomes of the organisation: (a) shareholder return (economic value added, total shareholder return, etc.) (b) product market

performance (sales, market share, etc.), and (c) financial performance (profits, return on investment, return on assets, etc.).

Researchers encounter several challenges when trying to measure organisational performance. Researchers argued that the structure, scale, and scope of organisational performance are difficult to effectively understand because of its multidimensional attributes (Devinney, Richard, Yip & Johnson, 2005). There are practical concerns regarding which measures should be used for organisational performance (for example, financial vs. non-financial measures or subjective vs. objective measures) (Devinney et al., 2005). Besides, organisational performance changes over time, and it is uncertain which indicators change in which manners (Lunardi et al., 2014). With that same reasoning, scholars suggested that two basic issues should be addressed in studies exploring organisational performance: (1) adoption of a conceptual framework that defines the organisational performance, and (2) identification of usable measures to operationalise organisational performance (Dess & Robinson, 1984). These issues are discussed in more detail below.

2.7.1 Conceptualisation of Organisational Performance

In investigating the organisational performance concept, it is imperative that organisational performance is well-defined and distinguished clearly from other strongly-associated concepts like organisational effectiveness. According to Venkatraman and Ramanujam (1986), financial performance (e.g. sales growth or profitability) is the narrowest concept of performance, while business (organisational) performance is labelled as the broader conception that emphasises on non-financial performance (e.g. product quality, marketing effectiveness). Nevertheless, business performance still mainly focuses on elements which result in the achievement of a company's financial targets. The term organisational effectiveness is applicable only

when numerous and contradictory objectives regarding other stakeholders are incorporated (Venkatraman & Ramanujam, 1986). Venkatraman and Ramanujam (1986) preferred the measurement domain identified by financial and non-financial performance rather than organisational effectiveness. Consistent with the authors, this study conceptualises organisational performance by non-financial performance measures.

2.7.2 Operationalisation of Organisational Performance

From the measurement aspect, according to Devinney et al., (2005), there are three methods that are mostly used for operationalising organisational performance as a dependent variable. The first method is applying a single measure that is supposed to precisely bond with organisational performance, while the second one uses various dissimilar indicators but compares them individually under common independent variables. Finally, the third method, which is also considered to be the most common one, is to adopt several dissimilar measures and combine them into one dependent variable.

There are many practices in the performance measure literature in relation to addressing and operationalisation of organisational performance. It is found in numerous studies in HRM research that incorporate different methods for operationalising organisational performance (Table 2.2). For instance, Zhang (2008) investigated the impact of HRM system on organisational performance through financial performance (i.e., market share increase rate, sales growth, profit rate, and ROI rate) and innovative performance (i.e., new service types, new methods, and new markets, etc.). Similarly, Leffakis and Dwyer (2014) examined the relationship between operational performance and HR system. They used operational performance as a one-dimensional construct combining several items, such as delivery and flexibility

performance, cost, and quality. Also, vein, De Grip and Sieben (2009) investigated the influence of HRM practice on firm productivity of 549 firms in Netherlands. In their study, they incorporated physical measure of productivity, such as workers' wages, to measure firm productivity. In the same way, Schiemann and Lingle (1999) assessed organisational performance from ROI of past three years and CEOs' appraising of their company on the basis of three standards: seen as an industry leader throughout the past three years, reported as the top third position based on financial capabilities in their sector, and last main operational change or cultural change judged as very or reasonably successful.

In IS research arena, a handful research shows influence of IS usage on organisational performance (Table 2.3). For instance, Ainin et al. (2015) measured the impact of IS adoption through financial performance indicators i.e., revenues, cash flow from operations, operating profits, return on investment. In the same way, Hong et al. (2012) investigated the relation between ERP usages in organisational performance of American firms. To measure organisational performance, they used both financial (Return on Assets) and non-financial performance (Quality) measures. Lunardi et al. (2014) measured eight elements of organisational performance (i.e., return on assets, return on equity, operating margin, profit margin, asset turnover, sales growth, operating expense to sales, share repurchase) over a three years' period.

Besides the dimensionality concern, it is an essential part of the research design for researchers in that they need to pay close attention to types of measures such as objective and subjective measures when they measure organisational performance.

Table 2.2: Previous Studies on HRM System and its Impact on Organisational Performance

Author(s)	Study country	Research methodology	Performance indices	Research findings
De Grip and Sieben (2009)	Netherlands	Questionnaire survey (n=549), Econometric model	*Physical measure of productivity:* a) firms' productivity, and b) workers' wages	- More advanced HR systems do not have any effect on firms' productivity
Katou and Budhwar (2006)	Greece	Questionnaire survey (n=178), Stratified random sampling, FA, hierarchical multiple regression	a) Effectiveness b) Efficiency c) Development d) Satisfaction e) Innovation f) Quality	- HRM systems have a positive impact on organisational performance, and this relationship has mediated effect of HRM outcomes of skills and attitudes. - They explain the mechanisms through which HRM systems improve organisational performance.
Katou (2015)	Greece	Questionnaire survey (n=1061), Stratified random sampling, SEM	a) Effectiveness b) Efficiency c) Development d) Satisfaction e) Innovation f) Quality	- The impact of HRM content on organisational performance is less strong compared to its impact through HRM process. - the psychological contract partially and positively mediates the HRM – performance relationship
Lin (2012)	China	Telephone survey (n=324), simple random sampling, FA	*Nonfinancial performance:* a) the development of products, services, and programs b) customer satisfaction c) productivity *Financial performance:* a) sales growth b) profitability	- The degree of adoption of Western HRM practices made no statistically significant difference between Chinese and foreign firms. - Western HRM systems are positively associated with firm performance in a Chinese context.

Table 2.2 Continued: Previous Studies on HRM System and its Impact on Organisational Performance

Author(s)	Study country	Research methodology	Performance indices	Research findings
Leffakis and Dwyer (2014)	USA	Web-based survey (n=148), Stratified random sampling, hierarchical multiple regression	Operational performance is a one-dimensional construct combining several items such as cost, quality, delivery and flexibility performance.	- Operational performance significantly increases when a bundle of complementary basic HRM practices are integrated in mass customisation manufacturing (MCM) contexts. - MCM has significant moderating effects on the HR system – operational performance relationship
Su and Wright (2012)	China	E-mail survey (n=197), FA, multiple regression analysis	a) Product/service performance b) Financial performance	- China based HRM system has much more significant positive effects on firm performance compared with American-style high-commitment and high involvement work practices.
Zhang (2008)	China	E-mail survey (n=221), Snowball sampling, SEM	*Financial performance :* a) sales growth, b) profit rate, c) ROI rate, and d) market share increase rate *Innovative performance:* a) new methods, b) new service types, c) new markets, and d) new process/method increase rates	- The overall effects of recruitment and development system, commitment system, employee ability, and employee incentive are significant to the financial performance. - The total effects of recruitment and development system and employee ability are significant to the innovative performance, but commitment system and employee incentive are not significant to the innovative performance.

Table 2.3: Past Studies on IT Application Adopted by firms and their relation with Organisational Performance

Authors /Country	Type of innovation	Research methodology	Performance indices	Research findings
Ainin et al. (2015) Malaysia	IS adoption	Questionnaire survey, (n= 104) FA, PLS techniques	*Financial performance:* a) return on investment, b) revenues, c) Cash flow from operations, d) operating profits	IS functional capabilities do influence the creation of customer value and ultimately organisational performance.
Chen and Zhu (2004) USA	IT adoption	Secondary data n =22 banks DEA	Efficiency	- They develop an efficiency model that identifies the efficient frontier of a two-stage production process linked by intermediate measures. - They characterize the indirect impact of IT on firm performance.
Hong et al. (2012) USA	ERP	Secondary data (n=469), simple random sampling, SEM	*Financial performance:* Return on Assets *Nonfinancial Performance:* Quality	A prospector business strategy enhances the firm's ability to achieve organisational capabilities and enables the firm to achieve higher levels of financial performance.
Lunardi et al. (2014) Brazil	IT governance	E-mail survey (n=87), Longitudinal analysis	*Profitability measures:* a) return on equity b) return on assets c) profit margin *Productivity measures:* a) asset turnover b) operating margin c) operating expense to sales *Market measures:* a) sales growth b) share repurchase	- By measuring pre and post adoption performance indicators, they found that companies that adopted IT governance practices improved their performance. - The effects of adopting IT governance mechanisms on financial performance were more pronounced in the year following adoption than in the year in which they were adopted.

Table 2.3 continued: Past Studies on IT Application Adopted by firms and their relation with Organisational Performance

Authors /Country	Type of innovation	Research methodology	Performance indices	Research findings
Ravichandran and Lertwongsatien (2005) USA	IS adoption	questionnaire survey, (n= 129) PLS techniques	Operating performance; Market-based performance	- Variation in firm performance is explained by the extent to which IT is used to support and enhance a firm's core competencies. - An organisation's ability to use IT is dependent on IS functional capabilities, which, in turn, are dependent on the nature of human, technology, and relationship resources of the IS department.
Rao, Guo and Chen (2015) China	IS adoption	E-mail survey (n= 182) random sampling, PLS techniques	*Balance scorecard approach:* a) financial b) customer c) internal business processes d) employee innovation and learning	IS maturity is positively associated with firm performance, and knowledge sharing partially mediates the effects of IS maturity
Saira, Zariyawati and Annuar (2010) Malaysia	AIS	Questionnaire survey (n=205), Stratified random sampling, Pooled OLS Estimation	Return on assets as net income over total assets	- SMEs that use AIS do increase their firm performance. - In encouraging SMEs adoption of IS, Malaysian government have allocated special grants to assist SMEs to acquire these systems
Zhang (2007) USA	IS adoption	Questionnaire survey, Secondary data (n= 164) Simple random sampling, Factor Analysis, regression analyses	*Profitability:* a) return on sales b) return on assets	- The results indicate that firms whose IS were complemented by unique knowledge and information enjoyed gains in ROS and ROA. - IS complemented by unique vertical integration and related diversification could also lead to higher ROA.

2.7.3 Type of Performance Measures

Drawing upon the organisational performance measure literature, performance measures are categories based on two perspectives: a) financial and non-financial measures, and b) objective and subjective measures.

2.7.3.1 Financial and Non-financial Performance Measures

Kaplan and Norton (1996) attested that financial performance measures are the oldest, most commonly practiced and widespread management accounting tool. They also mentioned that there are two core motives for the extensive use of financial performance measures. Firstly, the financial measures for organisational performance are almost always purely financial (like profit), and resonate directly with the firm's long-term goals and objectives. Secondly, financial performance measures that are well-chosen provide a comprehensive overview of an organisation's performance such as corporate or division profitability. Interestingly, intangible assets became exposed and started to dominate the competitive advantage source in the second half of the twentieth century (Argyropoulou, Ioannou & Prastacos, 2007). Consequently, the book-value-to market-value-ratio dropped to 20 percent in the end of the 20th century. And, the tangible assets' value denoted only a minor section of market values (Brewer, 2002). So, organisations started valuing the non-financial measures in evaluating the organisational performance. Particularly, these measures were associated with employees (for example, employee satisfaction-retention), customers (e.g., customer satisfaction-retention-acquisition), innovation, quality, culture, and so forth (Argyropoulou et al., 2007).

Numerous researchers have opted for the use of non-financial performance measures, while there is no recommendation to abandon the use of the more traditional financial measures. A plentiful study includes non-financial performance measures to examine

the influence of HRM system and IS adoption (Chen & Zhu, 2004; De Grip & Sieben, 2009; Katou, 2015; Katou & Budhwar, 2006). Based on previous research on HRM practices and IS adoption, this study includes non-financial measures for examining the organisational performance.

2.7.3.2 Objective Performance Measures

A performance measure that includes an impartial measurement, free of bias and prejudice, is called an objective performance measure. In these situations, the performance appraisal is not a matter of personal judgment or interpretation of results. Accounting and/or financial measures are widely used objective measures for measuring organisational performance.

Scholars revealed many complications for objective measures in survey study, particularly in a large sample research. In a survey research, objective data might be vulnerable to measurement error due to the confidential nature of the data and various accounting routines within firms (Dess & Robinson, 1984). Besides, a contemporary study contends that the same objective measure can be interpreted in different ways across, or even within industries. It becomes difficult to aggregate the objective measures due to implicit associations among them (Ketokivi & Schroeder, 2004). Also, there are several dimensions of organisational performance which cannot be observed directly since their existence is on in a cognitive sense.

2.7.3.3 Subjective Performance Measures

Subjective measures evaluate the opinion regarding organisational performance. These measures are influenced by the informant's personal judgment. These can be further divided into Quasi-subjective and Fully-subjective.

With Quasi-subjective measures, some measures (e.g., ROI or ROA) that are operationally defined can be found directly from an organisation in conceptual forms (Ketokivi & Schroeder, 2004). Here, the measurement units are well-defined in relative terms to competitors or industry. Scholars are generally oriented towards this perspective, herewith tackling the issue of low response rates when requesting respondents for actual data (Ketokivi & Schroeder, 2004). In this case, the credibility of performance data hinges upon the respondent's discretion. Ketokivi and Schroeder (2004) labelled these measures as Quasi-subjective measures.

Fully-subjective measures, as opposed to fully-objective measures, ask supposedly knowledgeable informants about organisational performance. These measures became common after augmented attention in the triple bottom line of economic, social, and environmental performance as well as the acceptance of a balance approach (Kaplan, 1996). Using such a type of measure can potentially undermine the credibility of data extracted. Researchers attested that the validity of the subjective measures is left on the quality of participant's recall of events and information of respondents (Lunardi et al., 2014). With that same reasoning, Ketokivi and Schroeder (2004) enumerated some potential problems that can arise with this type of measure, which are set as follows: (1) the honesty 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 encounters problems concerning cognitive biases. For example, respondents are generally oriented towards positive attitude toward themselves, interpret data in their favour, and take credit from unclear condition (Hong et al., 2012).

However, many scholars argued that problems regarding subjective measures may not be as acute as assumed. Firstly, some researchers contend that informants of

subjective measures are generally top-level executives who can be considered representatives of the company (Venkatraman & Ramanujam, 1986). In addition, these well-informed informants generally often have their assessment of organisational performance relying on information extracted from objective performance data (Wall et al., 2004). Secondly, an empirical research on organisational performance, conducted by Wall et al. (2004), confirmed the robust construct validity, and moderate convergent as well as discriminant validity of subjective measures. Moreover, a meta-analysis demonstrates that the association between subjective and objective data holds irrespective of the measurement perspective: overall vs. composite or relative vs. absolute (Bommer, Johnson, Rich, Podsakoff & MacKenzie, 1995).

2.7.3.4 Objective vs Subjective Performance Measures

Many empirical studies advocate that subjective performance measures is a viable approach, instead of objective measures. Researchers reported the association is as high as 0.8 between subjective and objective measures (Richard et al., 2009). Dess and Robinson (1984) asserted that subjective measures could be a plausible choice for objective indicators of performance. In a similar vein, researchers found a strong correlation in the midst of subjective and objective measures of financial performance (Hansen & Wernerfelt, 1989).

Ketokivi and Schroeder (2004), most recently, investigated the relationship amidst objective and subjective measures through addressing the application of various performance dimensions and by assessing several respondents. In the findings from the MTMM-CFA (Multilevel Multitrait-Multimethod - confirmatory factor analysis) examination indicates a strong reliability and medium validity of the subjective measures; thus, deducing that the usage of subjective indicators is plausible. Nevertheless, they refer to issues regarding single respondents who were heavily biased,

and bring about underestimation of the association between objective and subjective measures. Accordingly, they encourage scholars to pay more attention to finding out salient performance components of organisational performance and applying multiple items and multiple respondents. With that same reasoning, Wall et al. (2004) studied three separate samples and asserted that subjective and objective measures of performance show a high level of convergent validity (i.e., the connections between both indicators were positive) and an 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 utilised than when either only subjective or only objective measures were applied. 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.

Based on the above discussion, this study adopted subjective performance measure as a possible alternative. Following the suggestion of Ketokivi and Schroeder (2004), this research includes multiple items regarding organisational performance, as well as multiple informants from a company for appropriateness of subjective performance measures. Moreover, in a cross-sectional study, applying the subjective performance measures would be more appropriate when we face complications in extracting matched objective information accurately. Furthermore, key informants (e.g. CEO, CFO) typically deny providing numerical objective performance data requested in the instrument.

2.8 E-HRM Usage, Value Creation and Organisational Performance

Advances in IT have brought about changes in the HR functions within organisations. Nowadays, many organisations have come to use an HRIS or E-HRM to help their HR department with the fundamental functions of HR, such as facilitating administrative efficiency, ensuring improvement in decision making and making the sharing of information more efficient (Bondarouk & Ruël, 2013). In the same vein, Strohmeier (2007) reported that E-HRM improves the overall quality of HR activities and lifts a burden from the administrative tasks. Moreover, it results in improved responsiveness regarding information and greater autonomy of information. Furthermore, E-HRM applications boosts the HR process's efficiency in businesses (Ruël & van der Kaap, 2012), helps in making HR management decisions and automation of the administrative HR process, facilitates training effectiveness and career management, ensures improved job satisfaction, and ensures reduction in turnover (Maier et al., 2013).

When organisations are developing new avenues and methods for daily business, it is called value creation (Zhu & Kraemer, 2005). E-HRM provides the tools for managing human resources in a new way. The advantages of modern IT means that HRM procedures, HR policies, and HRM practices, have all been changed in nature (Wahyudi & Park, 2014). When such technology is implemented successfully, organisations may have the capacity to gain competitive advantages and unique benefits. Haksever, Chaganti and Cook (2004) define value as a good, service, or activity's capacity of satisfying a need or providing an advantage to an individual or legal entity. In the study, a "value" refers to the potential benefits of E-HRM, which in turn benefits the employee or organisation.

E-HRM usage creates value on a threefold level: the personal level, organisational level, and societal level (Bondarouk & Ruël, 2013). In the current study, the focus is on E-HRM usage and value creation at the organisational level. As such, the assumption is that the realisation of this is through improved delivery of the HR service. According to Bowman and Ambrosini (2000), the two forms of value creation are use value and exchange value. They state use value as the particular characteristic of a new job, service, or product in relation to the requirements of the users. It is possible to track it using the E-HRM system's transformational functions. The exchange value is referred to as the monetary sum generated from the exchange of a new task, product, or service. Majorly, the value arises from E-HRM by cost reduction. Past research clearly indicates that most of the literature focuses on use value rather than on exchange value (Ruël & van der Kaap, 2012). This is surprising in a way, as organisations invest substantial amounts of money in E-HRM. As a consequence, research could be expected lay emphasis on the outcomes of E-HRM in monetary terms. A likely explanation for this relatively skewed research focus is that organisations may not like to provide information on their E-HRM investments and financial or countable results (Bondarouk & Ruël, 2013).

A contemporary research done on 12 countries indicated that E-HRM assists HR fosters strategic growth, thereby increasing value (Parry, 2011). However, the researcher did not find any connection between cost savings and HR headcount reductions. The information brings forward a suggestion that organisations are utilising E-HRM not for decreasing their HR workforce, but rather for redeploying HR experts from transactional work to activities that are highly strategic and value-added. In agreement with this claim, Ruël and van der Kaap (2012) outlined that E-HRM usage has substantial contribution to the organisation's efficiency, effectiveness, and the quality of HR service. The explorative factor analysis was utilised in the identification

of the dependent variable's three dimensions (efficiency, effectiveness, and HR service quality), HRM value creation. In testing their hypotheses, researchers used a hierarchical regression analysis on 151 valid questionnaires.

In recent times, the Internet has increasingly revolutionised the manner in which people in organisations get information. Besides the channels like business-to-business and business-to-consumer, the internet has allowed HRM into going ahead with the implementation of the HR process where business-to-employee (B2E) solutions through E-HRM have become possible (Harris et al., 2002). Since administrative tasks are easily accessible via HR portals, HR specialists are supposed to ensure creation of extra time for activities concerning strategic HR (Ruta, 2005). This is further reiterated by Ruël and van der Kaap (2012), that E-HRM is recognised as a motivating force behind HRM value creation, by which the contribution of human capital facilitates the attaining goals in an organisation (that are in line with the business aims).

Basically, the aim of this technology does not only limit efficiency of operational HRM, but rather improves strategic HRM results (Maier et al., 2013). Strategic HRM results can be measured by organisational performance (Becker & Huselid, 1998), strategic alignment and competitive advantage (Bondarouk & Ruël, 2013). Nonetheless, the urge of adopting other complicated HR practices relying on the organisation's general work. Still, research on the link comparing HRIS/E-HRM applications and organisational performance remains uncovered (Bhuiyan, Rahman & Gani, 2015). Marler and Fisher (2013) made a review of about 40 studies regarding the applications of HRIS/E-HRM and firm/organisational performance from the year 1999 to 2011, unfortunately there was no empirical evidence between the highlighted associations.

2.9 Theoretical Paradigms for IT Adoption at Organisational Level

With regards to IT adoption, researchers have applied various theories and models to examine multiple determinants according to the dissimilar contexts of the IT adoption, which includes the attitude of the adopter as well as the character adoption. The most frequently used theoretical models are TOE Framework (Tornatzky & Fleischer, 1990), Diffusion of Innovation Theory (Rogers, 1995), TAM theory (Davis, 1989), the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh, Morris, Davis & Davis, 2003), Perceived Characteristics of Innovation (Moore & Benbasat, 1991), Theory of Reasoned Action (Fishbein & Ajzen, 1975), TAM 2 (Venkatesh & Davis, 2000), HOT-fit model (Yusof, Kuljis, Papazafeiropoulou & Stergioulas, 2008).

In this study, the HOT-fit model and TOE Framework are applied. Other popular theories are not considered here, because they are developed on individual context. E-HRM is a subcategory of IT-related innovations. Therefore, these two models can also be used as a theoretical foundation to investigate factors that affect E-HRM adoption in business organisations. The following sections will show these three innovation adoption theories.

2.9.1 Technology-Organisation-Environment (TOE) Framework

TOE theory gives a guideline of the analysis of adopting the IT at an organisational level (Tornatzky & Fleischer, 1990). Within the context of an organisation, the framework identifies the process of adaptation and innovation. There are three basic features that affect the innovation of adoption: the dimensions of technology, organisation, and environment. Technology dimension is the internal and external technology important to an organisation as well as the technologies present to make adoption possible. The dimension emphasises on the relationship between operationalisation and realisation of benefits and present firm competences of certain

adoptions. The organisation dimension are the descriptive features of a firm (e.g organisation size, managerial structure and degree of centralisation), resources (human and slack resources), and the communication process (formal and informal) among the workers. The environment dimension includes the competitors of the organisation, the market elements and the overall regulatory environment. Moreover, the external environment is the location within which the firm operates and encounters socio-political pressures (Tornatzky & Fleischer, 1990). The three basic elements feature on both sides, either on the constraints or on opportunities for technological innovation (Tornatzky & Fleischer, 1990). Therefore, they alter the manner in which an organisation perceives opportunities for searches and end up adopting latest technology (Figure. 2.1).

Several factors were taken into consideration when making the choice of utilising TOE Framework. Firstly, previous studies have recognised the TOE framework and forms well-established framework through which E-HRM adoption (Al-Dmour, 2014; Troshani et al., 2011) and similar IS application adoption (Gutierrez, Boukrami & Lumsden, 2015; Hung, Chang, Yen & Lee, 2015; Lin, 2014; Low, Chen & Wu, 2011; Pan & Jang, 2008; Wang, Wang & Yang, 2010) can be studied. Secondly, the TOE framework takes various dimensions into account, including technological dimensions, not forgetting the organisational and environmental dimensions. Lastly, the TOE is identified as framework with an associative belief that makes an assumption that both individuals and characteristics of the organisation shape changes that take place (Hameed et al., 2012a). The act of interaction makes the researcher to easily treat the factors and their interactions in a single model (Molla & Licker, 2005), which can comprehensively explain IS innovation adoption.

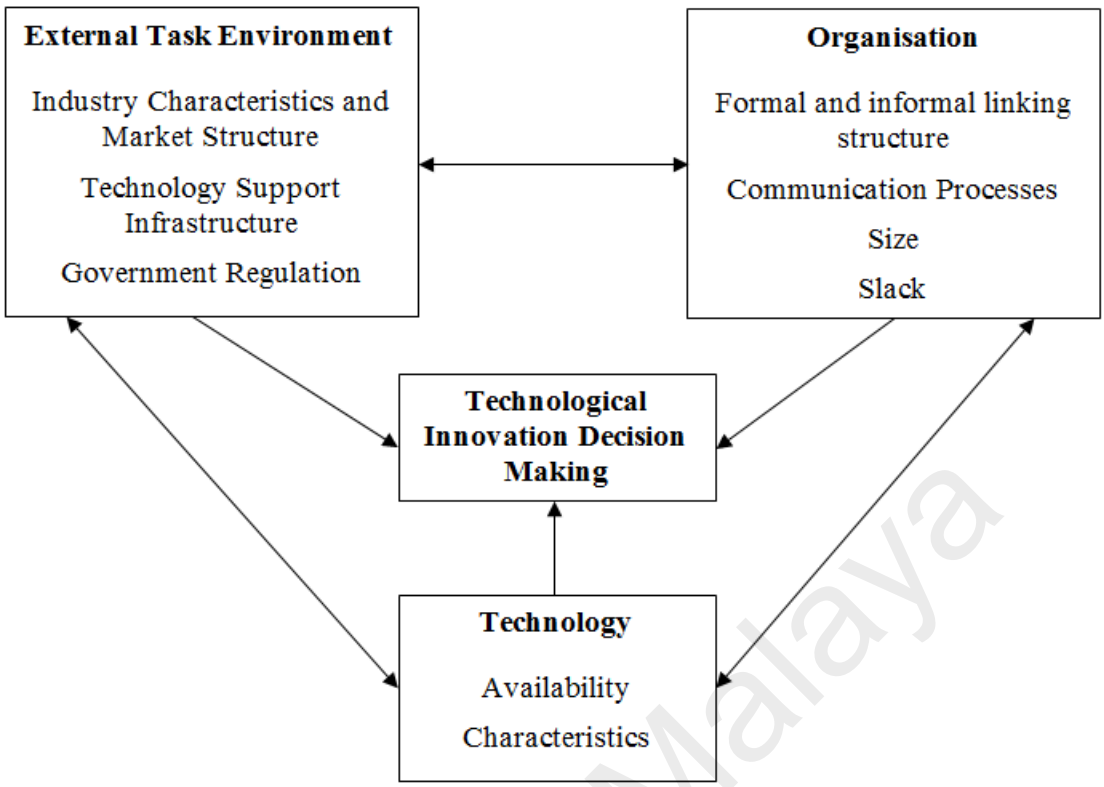


Figure 2.1: Technology-Organisation-Environment (TOE) Framework

Source: Tornatzky and Fleisher (1990)

Despite a number of positive views regarding TOE framework, the theory is not beyond criticism. One of these, as revealed by Oliveira, Thomas and Espadanal (2014), is that the framework assumes the factors which are in relation to human attributes concerning employees and managers. So, in this study, HOT-fit model was used to explore the influence of human attributes on E-HRM adoption.

2.9.2 Human-Organisation-Technology fit (HOT-fit) model

In 2006, Yusof, Papazafeiropoulou, Paul and Stergioulas developed a framework for IS adoption in hospitals that combined the concept of the IS Success Model (DeLone & McLean, 1992) as well as the IT Organisational Fit Model (Morton, 1991). Later, Yusof et al. (2008) highlighted the role of human factor for IS such as HIS (Health Information System) implementation in healthcare sector. Besides that, the HIS also needs to be supported and equipped with the technology. Organisations must have an ability to prepare workers or staff to adapt with new technology or changes that may occur. They

came up with an assessment based on the findings of the HIS and IS whereby they came up with a new model that included three dimensions: human, organisation, and technology (see Figure 2.2). This suggested model incorporated a category of exhaustive dimensions and magnitude of HIS. They proposed that better cohesion between human, organisation, and technology would promote higher chances of success of HIS (Yusof et al., 2008).

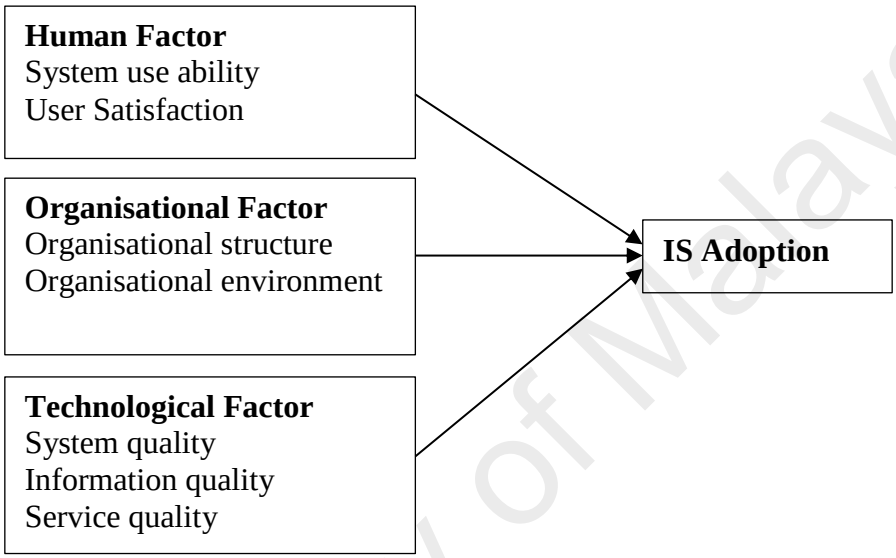


Figure 2.2: Human-Organisation-Technology (HOT)-fit model

Source: Yusof et al. (2008)

According to Yusof et al. (2008), a harmony of organisation, technology and human is the foundation of diffusion of IT since it is accountable for the crucial strategies that alter the investment of IT. In simpler terms, human and organisational cohesion should be treated like technical issues where the effectiveness of the system is concerned (Lian, Yen and Wang, 2014). There are several studies about 'fit' in the explanation of the co-relationship between human, organisation, and technology (Ahmadi, Nilashi & Ibrahim, 2015). A good number of the present evaluation studies concerning IS adoption majorly focus on the technical and organisational cases that are not present in human dimension such as senior executives' characteristics and staff technical competence for IS adoption

and implementation. To fill the research gap, Yusof et al. (2008) developed a comprehensive model (HOT-fit model) with three dimensions: human, technology, and organisation. But, another important dimension – environment – is absent in the HOT-fit framework.

Based on the analysis of Ahmadi et al. (2015), the HOT-fit model would be liberally applicable considering the different dimensions and aims, the proposals of the stakeholders, the system developments life cycle and lastly the methods of evaluation. The HOT-fit model is intensively concentrated on IS adoption i.e., HIS for hospital setting. Both HIS and E-HRM are subcategories of IS and the nature of IS usually does not vary in different settings. Accordingly, this study includes HOT-fit model to investigate the influence of human dimension (i.e., senior executives' characteristics and staff technical competence) on E-HRM adoption decision.

2.10 Related Literature on IT Adoption including E-HRM

In a HRIS adoption research, Teo et al. (2007) performed an examination concerning the associations between innovations, organisational and environmental features of 110 manufacturing firms in Singapore. This study applied TOE theory for determining adopting factors of HRIS. The researchers incorporated seven independent variables namely relative advantage, complexity, compatibility, organisation size, top management support, HRIS expertise, and competition as well as two dependent variables namely decision to adopt HRIS and extent of HRIS adoption (Figure. 2.3). Discriminant analysis of the data points to top management support, departmental relative advantage, HRIS expertise, compatibility, and organisation size as having positive relations with HRIS adoption decision. This study further examines whether there is an association amidst the extent of HRIS adoption (determined by a number of work areas utilised for HRM plus the summation of the HRIS uses.) and innovation

characteristics, organisational as well as the environmental variables. According to the outcomes, there is an indication that size has an association with the extent of HRIS adoption. The competition is only significant factor in the regression with computer workstation as a dependent variable, whereas top management support is only significant in the regression with the HRIS usage as the dependent variable. This study included only seven variables while past literature shows some other variables that were identified as significant factors for HRIS adoption (Table 2.4 & Table 2.5).

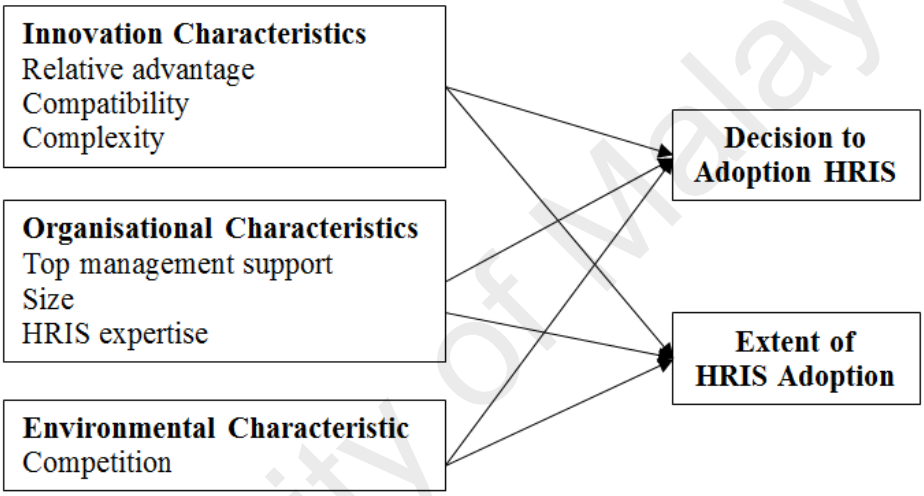


Figure 2.3: HRIS Adoption Model of Singaporean Firms

Source: Teo et al. (2007)

In another study, Bian (2012) adopted the TOE model to investigate the determinant factors impacting the E-HRM adoption among 200 China's companies. The study investigated the association amidst individual, organisational, technological, and environmental factors, and the adoption of E-HRM. Authors incorporated eight independent variables namely complexity, HR manager's attitude, top management support, HR manager's subjective norms, departmental relative advantage, compatibility, IT expertise, industry pressure and a dependent variable namely decision to adopt E-HRM (Figure. 2.4). Discriminant analysis of data collected indicates that IT expertise, compatibility, and top management support as well as overall industry

pressure are the significant factors to the organisational decision to E-HRM adoption. The findings of this study also reveals that compatibility and top management support are the most two important factors that distinguish between the non-adopters and adopters of E-HRM.

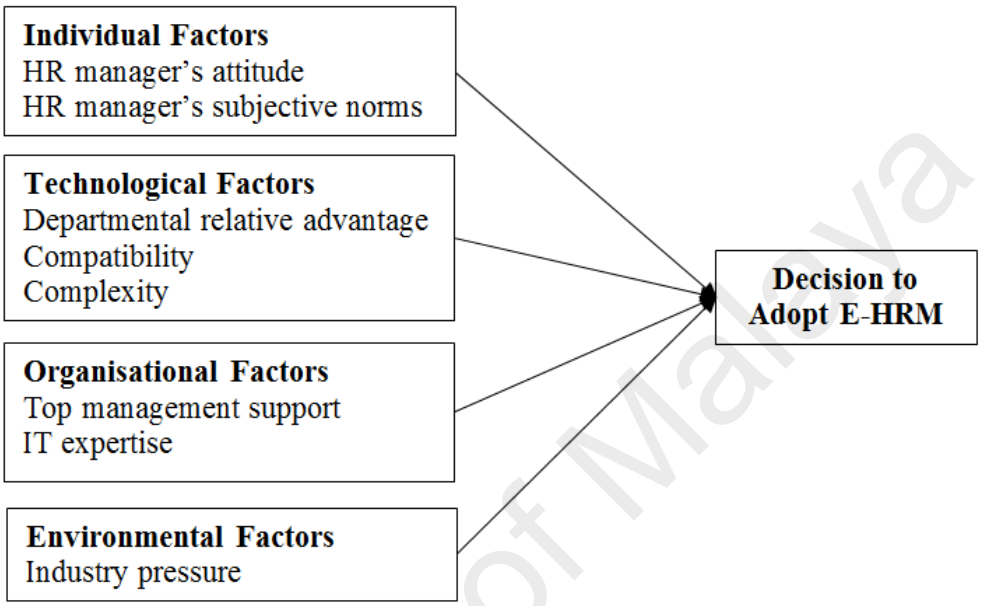


Figure 2.4: HRIS Adoption Model of Chinese Firms

Source: Bian (2012)

Troshani et al. (2011) made an attempt into identifying the influential factors for the HRIS adoption in firms in public sector of Australia. In this study, the scholars used the TOE framework as a conceptual framework (Figure 2.5), gathered qualitative data from the 11 firms in the Australian public sector. A conclusion from the research indicated that leading firms in the public industry opted to display HRIS merits prior to their adoption becoming a success. If the HRIS vendors adopted standardisation trends, then a comprehensive organisational fit in the midst of the business processes and adopted HRIS might be elusive for adopters, giving a suggestion that vendor support in post-adoption needs negotiations in order to offset customisation costs. Besides, several

organisational factors inclusive of human capability and management commitment, the outcomes displayed that wider environmental factors, comprising of the regulatory compliance, might have had a substantial influence on HRIS adoption success through the creation of the urgency about the adoption intentions. Nonetheless, in the study entirely focussed on the qualitative data collected from the Australian public industry's HR managers, and it is challenging to provide a generalization of such findings that are subjective qualitative.

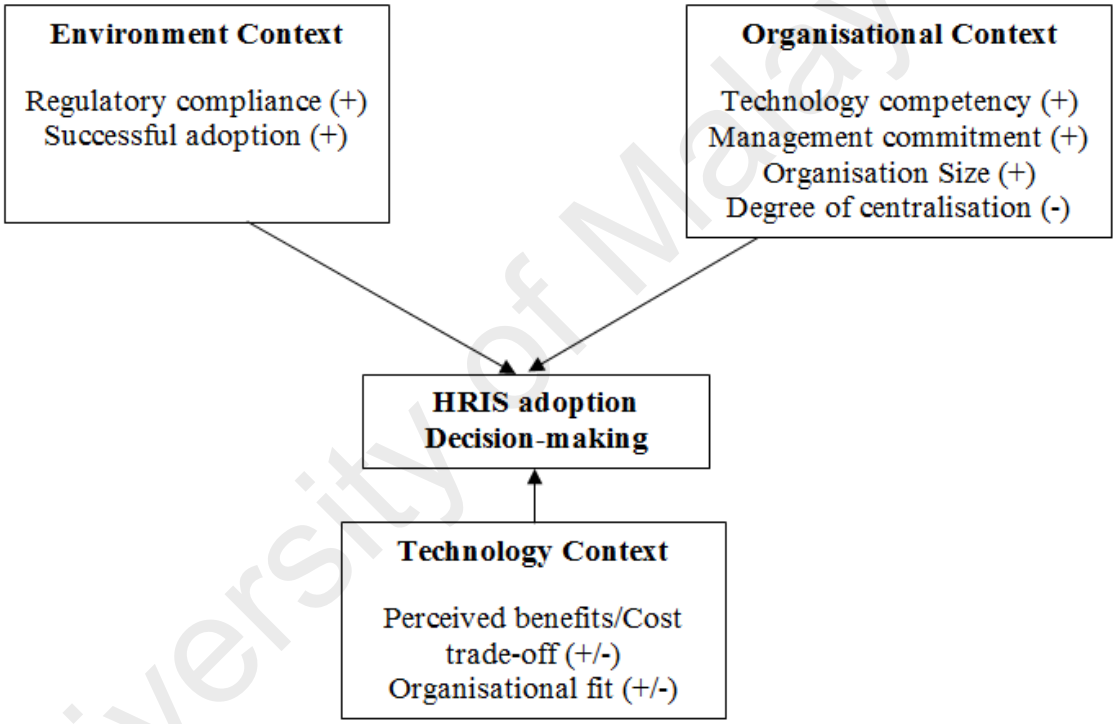


Figure 2.5: HRIS Adoption Model of Australian Public Sector

Source: Troshani et al. (2011)

On the other hand, scholars attested that the elements describing the characteristics of TOE theory vary according to IT and organisation business nature (Oliveira et al., 2014) but these researches ensured consistent empirical support for the TOE theory (Al-Dmour, 2014). With that same train of thought, past studies found the suitability of TOE framework for IS adoption research such as, adoption of e-commerce (Looi, 2005;

Oliveira & Martins, 2010), cloud computing (Gangwar, Date & Ramaswamy, 2015; Oliveira et al., 2014; Lian et al., 2014; Low et al., 2011), electronic supply chain management (Lin, 2014), health information system (Hung et al., 2015), e-maintenance (Aboelmaged, 2014), Radio frequency identification (Chong & Chan, 2012), HRIS (Al-Dmour, 2014; Troshani et al., 2011), etc.

Table 2.4 compiles TOE researches done by Oliveira and Martins (2010) and present studies from the literature providing an extension of the TOE model. In this updated study is the investigation of TOE's role in E-HRM adoption and implementation arena. In the Table 2.4, all related studies are summarised including country of study, type of innovation adoption, type of industry, research approach with data reliability results, and findings. In the findings column, all adopted independent variables are mentioned and the (*) indicates the researchers' results that are significant factors for respective innovation adoption.

Table 2.4: A Summary of IT/IS Adoption Research Applying TOE Framework

Authors	Study Country	Type of Innovation	Data and Context	Data analysis and Reliability	Theoretical Frameworks	Used Variables and Research Finding: Identified Significant Factors
Ahmad, Abu Bakar, Faziharudean and Mohamad Zaki (2014)	Malaysia	EC	Online questionnaire-based, mailed survey and questionnaire; 307 SMEs	Regression Analysis; Cronbach's alpha (α) = 0.84 to 0.96	TOE framework	Perceived relative advantage*; Perceived compatibility*; Perceived complexity; Managers/owner's knowledge and expertise*; Management characteristics*; External change agents*; Pressure from trading partners; Pressure from competitor.
Chau and Tam (1997)	Hong Kong	Open systems	Face-to-face interview, 89 firms	T-test, FA, LRA; (α) = 0.63 to 0.87	TOE framework	Perceived Benefits; Perceived barriers*; Perceived Importance of compliance to standards*, Interoperability, and Interconnectivity*; complexity of IT infrastructure; satisfaction with existing systems; formalization of system development and management*; market uncertainly.
Gutierrez et al. (2015)	United Kingdom	Cloud computing	Survey questionnaire; 250 firms from different sector	FA; LRA; (α) = 0.75 to 0.89	TOE framework	Relative Advantage; Complexity; Top Management Support; Firm Size; Compatibility; Competitive pressure*; Trading partner pressure*; Technology readiness*.
Hung et al. (2015)	Taiwan	HIS	Survey questionnaire; 182 hospitals	FA; MRA; MANOVA; Post-Event Analysis; (α) = 0.43 to 1.0	TOE framework	Compatibility; Relative advantages; Cost; Data security; Hospital size*; Top management support; IT infrastructure*; Relationship between staffs and doctors; Internal pressure*; External pressure*; External support*
Lin (2014)	Taiwan	e-SCM	Survey questionnaire; 283 firms	FA; LRA; (α) = 0.72 to 0.91	TOE framework	Perceived benefits*; Perceived costs*; Top management support*; Firm size; Absorptive capacity*; Trading partners; Competitive advantage*

Note: (*) indicates the researchers' results that are significant factors for respective innovation adoption.

Table 2.4 continued: A Summary of IT/IS Adoption Research Applying TOE Framework

Authors	Study Country	Type of Innovation	Data and Context	Data analysis and Reliability	Theoretical Frameworks	Used Variables and Research Finding: Identified Significant Factors
Low et al. (2011)	Taiwan	Cloud computing	Survey questionnaire; 111 High-tech firms	LRA (α) = 0.70 to 0.92	TOE framework	Relative advantage*; Complexity; Compatibility; Top management support*; Firm size*; Technology readiness; Competitive pressure*; Trading partner pressure*.
Oliveira and Martins (2010)	European Union (27)	e-business	questionnaire; 2459 Telco and tourism firms	FA; LRA (α) = 0.61 to 0.98	TOE framework	Perceived benefits*; Technology readiness*; Firm size; Competitive pressure*; Trading partner collaboration*; Technology integration.
Ramdani, Chevers and Williams (2013)	England	EA	Survey questionnaire; 102 SMEs	PLS technique (α) = 0.82 to 1.0	TOE framework	Relative advantage*; Compatibility*; Complexity*; size*; Top management support*; Organisational readiness*; Trialability*; Observability*; Competitive pressure*; ICT experience; Industry*; market scope*; External ICT support.
Troshani et al. (2011)	Australia	HRIS	Face-to-face interview; 16 executives, Public sector	Qualitative	TOE framework	Perceived benefits-costs trade-off; Human capability* (HR domain knowledge, technical IT/IS skills; and communication skills); Management commitment*; Organisation size; Degree of centralisation; Regulatory compliance.
Wang et al. (2010)	Taiwan	RFID	e-mail survey; 133 manufacturing firms	FA; LRA (α) = 0.71 to 0.91	TOE framework	Relative advantage; Complexity*; Compatibility*; Top management support; Firm size*; Technology competence; Competitive pressure*; trading partner pressure*; Information intensity*.

Note: (*) indicates the researchers' results that are significant factors for respective innovation adoption.

Table 2.5 summarises some studies that use a combination of TOE framework with additional theories and realised notable consistency in empirical support to the TOE adoption both exclusive and inclusive of other frameworks (Sajjad, 2014). In Table 2.5, all related studies are summarised including research context, research approach with data reliability results, and findings. Table 2.5 also includes adopted independent variables. In addition, the (*) with the independent variables indicates the researchers' results that are significant factors for respective innovation adoption. It is common for TOE to be coupled with additional theories making it an increasingly sufficient and applicable in the domains of the complex IT. Studies in the literature have combined TOE framework with Diffusion of Innovations (DOI), TAM, HOT-fit, UTAUT, and Institutional Theory to understand adoption of e-maintenance (Aboelmaged, 2014), HIS (Ahmadi et al., 2015), HRIS (Al-Dmour, 2014), RFID (Chong & Chan, 2012), EC (Ghobakhloo, Arias-Aranda & Benitez-Amado, 2011), Cloud computing (Gangwar et al., 2015; Oliveira et al., 2014; Lian et al., 2014), and Software applications (Thong, 1999).

Table 2.5: A Summary of IT/IS Adoption Research Applying Multiple Theories

Theoretical Frameworks	Type of Innovation	Used Variables and Research Finding: Identified Significant Factors	Data and context	Data analysis and Reliability	Author(s)
TOE and TRI	e-maintenance	Technological infrastructure*, Technological competence*, Perceived benefits*, Perceived challenges*, firm size*, firm ownership*, Maintenance Priority, competitive pressures	Questionnaire survey; 308 UAE firms	SEM Cronbach's alpha (α) = 0.81 to 0.93	Aboelmaged (2014)
TOE and HOT fit model	HIS	Champion's innovativeness, Perceived technical competence*, Compatibility, Complexity, IS infrastructure, Relative advantage*, Hospital size*, Top management support, Business competition, Vendor support, Government policy*	12 executives, Interview Malaysia	ANP and DEMATEL method	Ahmadi et al. (2015)
TOE, UTAUT	HRIS	Perceived benefit*, Complexity*, Compatibility*, IT experience & capabilities, facilitating conditions*, Size and experience, Employee structure*, Formalisation*, Top manager support*, Social and technology skill*, Availability of IT suppliers & activities*, Competition pressure* , Social influences*, Government policies and support*	Questionnaire; 236 firms Jordan	MRA, Bivariate correlation (α) = 0.77 to 0.94	Al-Dmour (2014)
TOE and DOI	EC	Perceived relative advantage*, Perceived compatibility*, Cost, CEO's IS knowledge, CEO's innovativeness*, Business size, Information intensity*, Buyer/supplier pressure*, Support from technology vendors*, and Competition*	Questionnaire survey; 235Iranian firms	FA, MRA (α) = 0.71 to 0.91	Ghobakhloo et al. (2011)

Note: (*) indicates the researchers' results that are significant factors for respective innovation adoption.

Table 2.5 continued: A Summary of IT/IS Adoption Research Applying Multiple Theories

Theoretical Frameworks	Type of Innovation	Used Variables and Research Finding: Identified Significant Factors	Data and context	Data analysis and Reliability	Author(s)
TOE and TAM	Cloud computing	Relative advantage*, Compatibility*, Complexity*, Organisational readiness*, Top management commitment*, Training and education*, Competitive pressure*	Questionnaire Survey; (n=280)	EFA, CFA, SEM (α) = 0.62 to 0.94	Gangwar et al. (2015)
TOE and HOT fit model	Cloud computing	CIO innovativeness, Perceived technical competence*,Compatibility, Complexity*, Data security*, Cost*, Relative advantage, Top manager's support*, Adequate resource, Benefits, Government Policy, Perceived industry pressure	Questionnaire Survey; 60 organisation of Taiwan	FA, DA (α) = 0.63 to 0.94	Lian et al. (2014)
TOE and DOI	Cloud computing	Relative advantage*, Compatibility, Complexity*, Technology readiness*, Top management support*, Firm size*, Competitive pressure, Regulatory support	Questionnaire Survey; 369 firms of Portugal	SEM (α) = 0.81 to 0.96	Oliveira et al. (2014)
TOE and DOI	Software applications	CEO's innovativeness*, CEO's IS knowledge*, Relative advantage of IS*, Compatibility of IS*, Complexity of IS*, Business size*, Employees' IS knowledge*, Information intensity, Competition	Letter with questionnaires, 166 small firms; Singapore	T-tests, FA, DA, and PLS; (α) = 0.64 to 0.90	Thong (1999)

Note: (*) indicates the researchers' results that are significant factors for respective innovation adoption.

Elaboration:
ANP = Analytic Network Processes; CFA = Confirmatory factor analysis; DOI theory = Diffusion of Innovation theory; DA = Discriminant analysis; DEMATEL approaches = Decision Making Trial and Evaluation Laboratory approaches; EC = Electronic Commerce; EFA= Exploratory factor analysis; FA = Factor analysis; HIS= Health Information System; HRIS = Human Resource Information System; HOT model=Human Organisation Technology model; LRA = logistic regression analysis; MRA= Multiple Regression Analysis; RFID = Radio Frequency Identification device; SEM= Structural equation modeling; TOE framework=Technology-Organisation-Environment framework, TRI= Technology readiness index.

2.11 Theories on User Attitude, Usage Experience and Value Creation of IT applications

E-HRM usage as well as value creation has emerged as an interesting topic. Multiple theories and models on diffusion of technology innovation and E-HRM value creations were drawn to seek answers to the research questions of the present study. In the determination of how E-HRM usage impacts organisational performance, an attempt into the review of literature on the post-adoption phase of E-HRM applications was done. This included researching past theories and models like the evolutionary game theory (Kauffman, Wang & Miller, 2002), the IS assessment selection model, the data envelopment analysis (DEA) model and the resource-based view theory (Zhu & Kraemer, 2005). Nevertheless, given the selection of an organisation as a unit of analysis, the most outspoken theories and models that associated with this study were the evolutionary game theory and RBV theory which will be illustrated in later sections of this chapter.

2.11.1 Technology Acceptance Model (TAM)

Davis (1989) introduced the TAM, which focuses on predicting IT user acceptance and explaining the individuals' behaviour in the acceptance of IT applications. A hypothesis by TAM indicated that the traits of IT adoption influencing user adoption come in two-fold: 'perceived ease of use' and 'perceived usefulness' (Davis, Bagozzi & Warshaw, 1989; Davis, 1989). Figure 2.6 demonstrates TAM proposition.

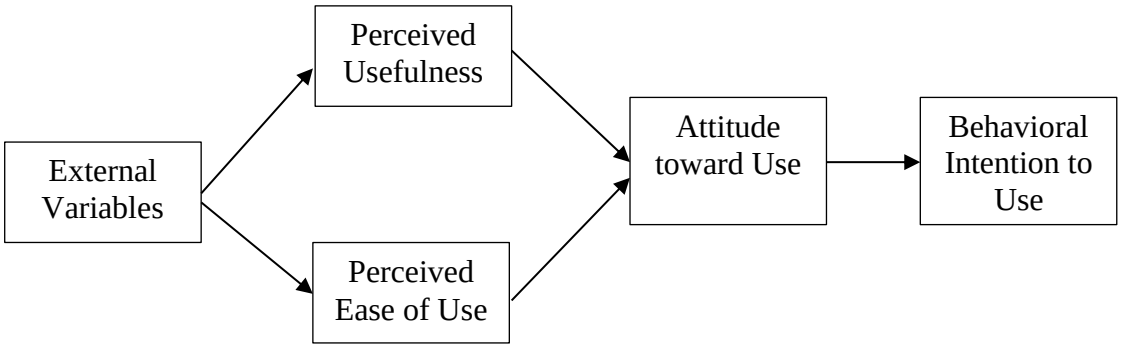


Figure 2.6: Technology of Acceptance Model

Source: Davis, Bagozzi and Warshaw (1989)

Perceived Usefulness alludes to the level an individual trusts who utilise a given system that would boost their performance in a job. Perceived ease of use points to the degree to which an individual trusts that making use of a specific system would not require any effort (Davis, 1989). The two elements help to determine the user's attitude towards applying the IS. User's attitude is directly related to their intention that will subsequently determine how the system and technology is used.

Chang, Chen and Lan (2012) investigated employees' job satisfaction with a newly implemented IS in hospitals. They attested that employee's job satisfaction is affected by system's perceived ease of use and perceived usefulness. Users' perception has an effect on their attitudes and behavioural intention as well as usage behaviour. They concluded that, employee's job satisfaction has a great impact on their work performance and commitment to the organisation. Similarly, Maier et al. (2013) confirms the impact of perceived ease of use and perceived usefulness of HRIS on HR personnel's job satisfaction

Research about technology adoption utilises well-supported theories and frameworks explaining a person's IT innovation usage. These can be useful in getting to know the

impacts of an HRIS implementation for both the potential users of the system and employees (see Venkatesh et al. (2003) for an overview). Such study is frequently based on the TAM theory and gives provides empirical evidence pointing to individual's beliefs and attitude toward the use of an information system that influences their intentions in using the system and consequently their usage behaviour (Davis, 1989). Several studies have evaluated and discussed this relationship. However, not all researchers agree that the perception and attitude towards using systems can predict the behaviour of the employees' usage in organisations, particularly when companies mandate that their employees use the new system (Brown, Massey, Montoya-Weiss & Burkman, 2002). When organisations are implementing new information systems and insisting on their usage, employees will be forced to use them, even if they hold negative attitudes and beliefs towards the system. It then follows that a person's attitude to the use of a newly implemented IS may not be necessarily related to the behavioural intent to using it and the resulting usage behaviour (Brown et al., 2002).

Hence, based on findings of Chang et al.(2012) and Maier et al. (2013), it is assumed that job satisfaction will be affected for newly E-HRM implementation. And, it will play a role between E-HRM usage and organisational performance.

2.11.2 Evolutionary Game Theory

The theory applied the mathematical theory of games in biological context; it arose from the realisation that frequency dependent fitness introduced a strategic evolution. Developed by Fisher (refer The Genetic Theory of Natural Selection) in 1930, the theory aimed at explaining the estimated sex ratio equality in mammals.

As the theory applied both the analogy of bio-diversity theory and genetic survivability in population ecology to a variety of species in an increasingly competitive organic biome, it can also be applied to social science research. Kauffman et al. (2002)

tested the e-business organisations' strategic morphing and survivability using the evolutionary game theory. Applying the theory to e-business context, the authors emphasised on how firms survived by having strategic fitness to compete in the marketplace.

Studying the application of the evolutionary game theory among DotCom companies (companies that do most of their business on the internet), environmental interaction, competition, genes and mutation were found to be the predictors of success or failure among companies. The theory identified that specific character of an industry, specific firm factors and e-business specific factors were drivers to survivability of DotCom companies (Figure 2.7).

Applying the evolutionary game theory, it was found that when abundant resources were available and when competition was not strong, organisations with low-grade genes tended to survive. However, in a situation of limited resources, high competition might weed out organisations with superior genes. In this theory, firms came to realise the success factors through exploration, experimentation, market examination, and learnt from competitors' experience (Kauffman et al., 2002).

In a cross-sectional study, Salwani, Marthandan, Norzaidi and Chong (2009) combined evolutionary game theory with TOE model to determine the moderating effect of e-commerce experience. They stated that, in comparison to the TOE model, the evolutionary game theory seemed to be similar as industry specific characteristics could be represented by environmental characteristics while both firm specific characteristics and IS (E-HRM) specific characteristics were related to organisational characteristics and technological characteristics. It was therefore concluded that the evolutionary game theory intersected the TOE model when applied in the study of E-HRM usage.

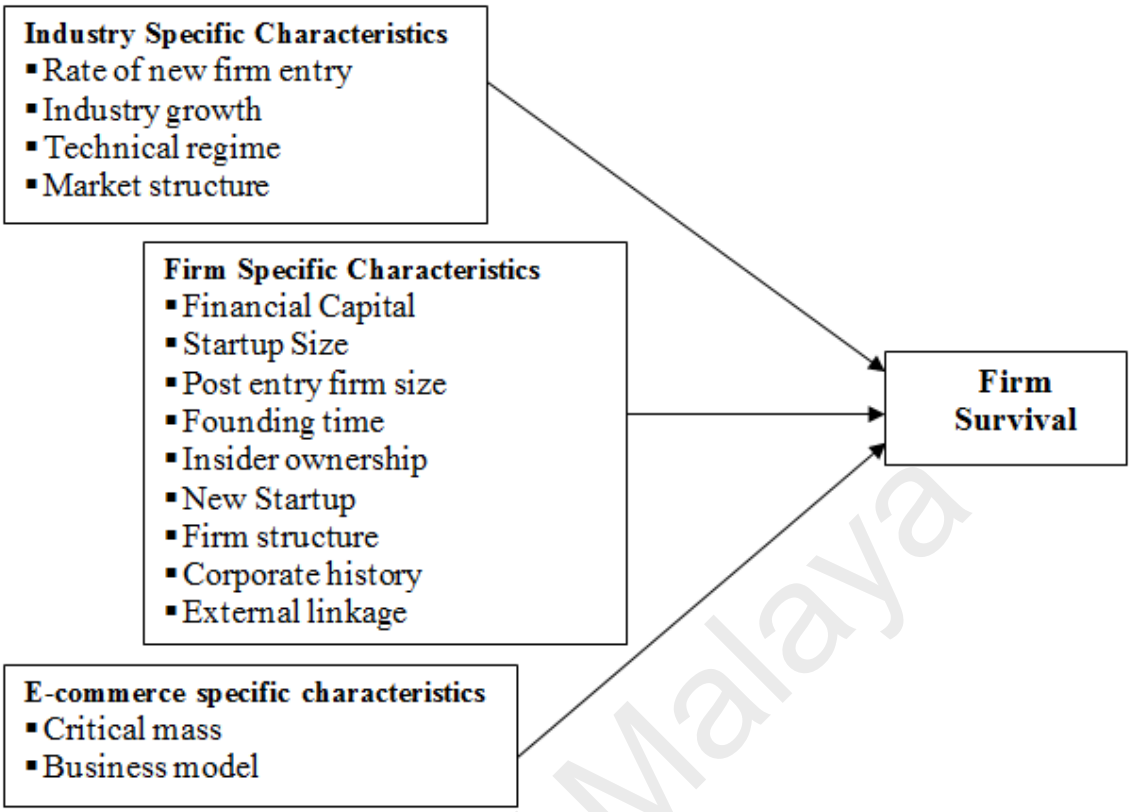


Figure 2.7: Factors of DotCom Survival in Evolutionary Game Theory

Source: Kauffman et al. (2002)

2.11.3 Resource-based View (RBV) Theory

Penrose (1959) originally introduced the resource-based view (RBV) and later, Wernerfelt (1984) tried to realise the notion. The organisation's RBV aims at how organisations acquire value using their resources' strategic application (Ferguson & Reio Jr, 2010). The RBV gives a definition of the firm as historically collected wealth of resources which are rare, valuable, inimitable and imperfectly substitutable as well as being the organisation's primary source of competitive advantage (Wang et al., 2010). According to RBV theory, businesses is developed using the resources and capabilities that a company has (Zhu & Kraemer, 2005). And, resources are the strengths or weaknesses of the firm (Wernerfelt, 1984). Several authors have utilised the RBV theory in field of strategic HRM (Ferguson & Reio Jr, 2010).

The role of HR in developing a competitive advantage has had substantial interest in the literature on RBV. In 1959, Penrose proposed that value creation from utilising resources is dependent on the manner of development and usage by the organisation. As such, people's knowledge, skills and actions are required so as to create value from resources. Researchers argue that competitive advantage only takes place in cases where given resource inputs perform heterogeneously across various organisations and that the only resource with this capability is the HR staff. Consequently, HR are sources of beyond normal returns, other than tradable or physical assets (Bowman & Ambrosini, 2000). Indeed, in agreement to this, Lepak and Snell (1998) stated that the HR activity's value is greater when it is used in helping firms towards achieving a competitive advantage. The documented strategic HRM literature has emphasises that HR function has the potential of producing HR and organisational capabilities essential in the achievement of a competitive advantage (Marler & Fisher, 2013). Hence, it is possible to treat the E-HRM itself as a resource, given that it has the ability to have an influence on the organisation's competitive advantage.

In a study on e-business usage and value creations, Zhu and Kraemer (2005) performed integration on both the TOE model and the RBV theory in an assessment of firm's e-business usage and value creations. Based on Zhu and Kraemer, e-business leveraged the distinct features of the internet when they looked for ways to improve business performance. In their study, they have provided an investigation of the e-business functions that utilised the internet's distinct feature characteristics that expedited the value creations. In this study, classification of e-business capabilities is defined as front-end functionalities and back-end integration. Earlier discussion indicates that usage of E-HRM creates some value to improved HR service delivery and that increases the possibility of competitive advantage in the organisations (Bondarouk

& Ruël, 2013). So, TOE framework, HOT-fit model and the RBV theory were integrated in assessing E-HRM usage and value creations by organisations in this study.

2.12 Summary on Past Studies and Theories

The Table 2.4 highlights the different ways in which TOE theory impacts the IT adoption and as well as showing that some factors are recurring while others were newly added in the study of a specific technology. It provides support to the current studies through permitting the selection of some factors which might have an influence on E-HRM technology and with the potential for further investigation into its influential power. The study takes into account Table 2.4 and Table 2.5 as valuable addition to this field and bridges the gap in knowledge on TOE theory. There have been few studies investigating the E-HRM adoption phenomenon that help to identify factors that may influence E-HRM technology adoption. However, a few researchers applied TOE framework in the E-HRM adoption in Asian context such as China (Bian, 2012), and Singapore (Teo et al., 2007) but no study on Bangladesh, resulting in a gap in the literature, highlighted in Table 2.4 and Table 2.5 .

It is still possible to utilise the classical diffusion theory in the adoption of innovations by organisations; however, there needs to be modifications and extensions (Rogers, 1995). As aforementioned, these adoption frameworks have in most cases been designed for and used in the adoption of technology in nations that are developed. It is worth noting that, the technology adoption in developed nations might be distinct from that in the nations that are in the developing phase, as the challenges are distinct to a variety of locations (Molla & Licker, 2005). The situations either economic, social or cultural of the developing and developed countries are varying; hence, technology adoption framework of developed nations needs to be modified to take into account the specific needs of developing countries. Humphrey, Mansell, Paré and Schmitz (2003)

observed that in almost all developing countries, adoption of Information Technology has been barred by the readiness and cost of accessing the necessary infrastructure as well as the quality of these infrastructures.

For developing countries, Williams and Edge (1996) showed two concerns that should be put under consideration: the impacts of technology and external competitive situations on HRM are un-deterministic, and various challenging theories exist regarding the way organisations have a likelihood of combining technology and human resources as well as the possibility of finding empirical support for all; and countries are distinct in underlying organisational principles and institutional traits embedding the HRM philosophies and practices. Concurrently, empirical research studies have shown that the influential factors vary according to the country (Zhu, Kraemer & Xu, 2006; Zhu & Kraemer, 2005; Zhu, Kraemer & Xu, 2003). As such, it is significant to realise the factors affecting an organisation's decision concerning information systems adoption.

In looking at different IT innovation and diffusion, the theory of technology diffusion by Rogers (1995), and the TOE model by Tornatzky and Fleischer (1990) were used extensively in prior studies. DOI theory is still one of the outspoken popular technological adoption behavioural frameworks. Since the DOI theory only depicts the behaviour of individuals in adopting technological innovations that are new, various scholars have coupled DOI theory with other theories in describing the process of adoption and its utilisation in organisations (Al-Dmour, 2014).

Despite the various positive perspectives on the TOE framework, this theory is not exempt from criticism. Oliveira et al. (2014) reveals that this framework is ignorant of the factors associated with human characteristics of managers and employees. The TOE framework was only used as an analytical tool in differentiating between the inherent

innovation qualities and motivations, capabilities as well as wider environmental context for the adoption organisations (Aboelmaged, 2014). Zhu and Kraemer (2005) for instance, integrated the TOE framework with the RBV theory in investigating the variation in e-business post-adoption application and value creations. As a result, the integration of TOE with other theories to study E-HRM usage and value creation will add more significant value.

Recently, HOT-fit model by Yusof et al. (2008) also attracted scholar's attention for its human factors in the organisational level. But, they did not include the external factors i.e. environmental issues that are also considered influential technology adoption factors in organisational level. However, in relation to organisation as the unit of analysis, the TOE model widely applied innovation and diffusion theory in IS and E-HRM research arena (Aboelmaged, 2014; Lian et al., 2014; Bian, 2012).

Notably, much existent research has laid emphasis on adopting decision and measures like 'adoption versus non-adoption' and 'intent to adopt' (Zhu & Kraemer, 2005). In essence, it is essential in the comprehension of the adoption decisions; however, there is an increased need for improved comprehension regarding the adoption and post-adoption changes in implementation and efficiency. In the present study, the focus is on the adoption and post-adoption phases of E-HRM (its impact). So, it is essential in modifying the existing theory towards achieving the current study's objectives.

As HOT-fit model and TOE framework are not inclusive of the post-adoption innovation behaviour process of adoption, user acceptance frameworks require incorporation towards fully explaining the pre-adoption, adoption-decision and post-adoption phases of information systems adoption. Thus, the HOT-fit model and TOE framework can form the foundation for the model of the process of adoption;

concurrently, TAM could play a key role in the assessment of the user acceptance of information systems. Previous research has combined TOE theory with TAM (Gangwar et al., 2015) in providing a description of the IT adoption behaviour.

TAM offers theoretical grounds for the examination of the factors influencing individual IT acceptance and been found to be successful in the prediction and provision of explanation for the usage of IT (Hameed et al., 2012a). TAM has been utilised broadly in research and has received empirical approval as being suitable in the examination of the acceptance of any technology by several user groups (Chang et al., 2012). As such, TAM can be applied in the evaluation of user IT acceptance at the post-adoption phases (Hameed et al., 2012b).

In the review of literature about technology diffusion and value creation, it was found that the RBV theory had been used extensively compared to the evolutionary game theory. The evolutionary game theory is quite similar to the TOE model. As in Kauffman et al. (2002), the drivers of DotCom survival in the evolutionary game theory were categorised into three: industry specific characteristics (similar to environmental dimension in the TOE model); firms specific characteristics (similar to organisational dimension in the TOE model); and E-business specific characteristics (similar to technological dimension in the TOE model). Seeing this as a repetition, and due to lack of literature on the evolutionary game theory when considering the factors that determine the usage of e-business on the performance of an organisation, the researcher believed that the TOE model was more reliable to study the drivers of e-business usage. Similarly, by combining the RBV theory and TOE model could propose meaningful results on how E-HRM applications influence organisational performance.

2.13 Gaps in Knowledge Area

Even though the developments in the field of IT and the impact these have had on HRM are significant, the current literature on E-HRM remains limited (Bhuiyan et al., 2015). This is mostly the case for research concerning developing countries, as well as for information regarding E-HRM usage and the impact this has on performance from the organisational point of view. Bian (2012) and Teo et al. (2007) investigated E-HRM adoption with limited factors. However, the impact E-HRM usage has on organisational performance is a phenomenon that has not been highlighted by empirical evidence in past studies (Bhuiyan et al., 2015). Within the field of E-HRM, a large number of studies have been carried out focusing the importance, usage, and pre-adoption and post-adoption determinants, and mostly focus on the developed countries. Nevertheless, a thorough examination of literature reviews has shown that knowledge gaps exist in most notably the following areas:

- When examining academic literature, a broad array of organisational factors that can be reviewed further are uncovered. A broad literature review on IS adoption shows that there is a lack of studies conducted on E-HRM adoption, and that numerous research projects have been carried out on different types of IS (electronic supply chain management - e-SCM, ERP, etc.) adoption in different settings. The majority of previous literature studies were conducted in Western countries. These nations have different governmental policies, as well as having diverse socio-economic, industrial and cultural environments as compared to the climate in developing countries. When analysing earlier studies, it becomes evident that the domain of E-HRM adoption behaviour remains an area that is under-researched. The vast majority of these earlier studies mainly concentrated on the current status of E-HRM usage and on other applications created for HR purposes. However, a few researches on the E-HRM adoption factors in an Asian

context were found, such as studies on China (Bian, 2012) and Singapore (Teo et al., 2007), but no study defined the situation in Bangladesh. For that reason, the research findings in this work would facilitate the narrowing of the dearth of literature on factors of E-HRM usage and its influence on organisational performance of the organisations in Bangladesh.

- A comprehensive study concentrating on the interactive and multi-dimensional theoretical model which evaluates factors determining E-HRM usage on organisational performance is absent to this day. Several models have been highlighted in previous studies, including the TOE framework and a combination of the TOE framework and the Resource-Based View (RBV) theory. These works have explored factors of IT application usage and business performance (Zhu & Kraemer, 2005), but no study has specifically been conducted on E-HRM.
- TOE framework (Tornatzky & Fleischer, 1990) is the most prominent technology adoption theory in organisational level. The theory incorporated three dimensions i.e. technological, organisational and environmental. But, this model ignores factors related to human attributes such as IT expertise and innovativeness concerning employees and managers (Oliveira et al., 2014). Moreover, the recent adoption model named HOT-fit model (Yusof et al., 2008) in organisation-level also failed to depict the complete scenario of adoption factors. They ignored external factors. Hence, there is a theoretical gap. Combining four dimensions (i.e., human, organisational, technological, and environmental), the potential factors could significantly predict E-HRM adoption.
- In E-HRM adoption research, researchers have incorporated limited variables to examine their influence on E-HRM adoption (Bian, 2012; Teo et al., 2007). However, Wejnert (2002) demonstrated that earlier studies encompass a wide array of factors which were included in other IS adoption research. He also stated

that the probability of the possible adoption of E-HRM can be significantly influenced by this. Hence, other potential variables were lacking in E-HRM research that could significantly influence E-HRM adoption.

- Lack of empirical evidence for the E-HRM impact on organisational performance. Marler and Fisher (2013) reviewed 40 studies (conducted between 1999 and 2011) that examined the relationship between the E-HRM applications and organisational performance, and found no empirical evidence regarding the aforementioned relationship. This leads us to conclude that a lack of research conducted on the impact of E-HRM applications on organisational performance still exists.
- Information on the moderating variable such as E-HRM usage experience in connection with the "E-HRM usage – organisational performance" relationship is still missing in contemporary research.
- The effect of a mediating variable, HR personnel's job satisfaction, on the relationship of "E-HRM usage – organisational performance" is missing.

When trying to close the gaps above, a need to test the direct influence and indirect influence of the variables arises. Furthermore, it has been argued that the relationship between independent and dependent variables might be influenced by the existence of a moderating variable and/or mediating variable. It has been believed that performance measurements in a multi-dimensional theoretical model need to have a non-financial perspective, from both the IT as well as the HRM view. These have led to the development of a theoretical model (E-VALUE) model that examined factors determining E-HRM usage on organisational performance. Hence, the E-VALUE model is proposed by combining the TOE framework, HOT-fit model, evolutionary game theory, TAM, and the RBV theory that have sought empirical evidence on

variables identifying E-HRM usage on organisational performance to suit technological innovation of performance measurement.

2.14 Development of E-VALUE Model

One of the main objectives of this study is to examine the effect that eleven different factors have on the usage of E-HRM at the organisational level. Within the context of this research, the relation between E-HRM usage and organisational performance is examined based on RBV theory. Moreover, the role of a moderating value of business experience with E-HRM is examined on the relationship of "E-HRM usage – organisational performance" based on evolutionary game theory. Moreover, the mediating effect of job satisfaction of HR personnel on the said relationship is also be examined by measuring job satisfaction of HR personnel based on TAM. Based on the review of previous literature, this study proposes an E-VALUE model that is based on a TOE framework, evolutionary game theory, HOT-fit model, TAM and RBV theory. With this, a multi-dimensional theoretical model is proposed. The E-VALUE model is proposed, as to be able to close the knowledge gaps that exist in current literature.

2.14.1 Factors of E-HRM Usage at Organisational Level

In Figure 2.8, four dimensions are classified, i.e. human, technological, organisational and environmental. These factors constitute the proposed E-VALUE model, and, founded on the TOE framework and the HOT-fit model that relate to the usage of the E-HRM application at the organisational level.

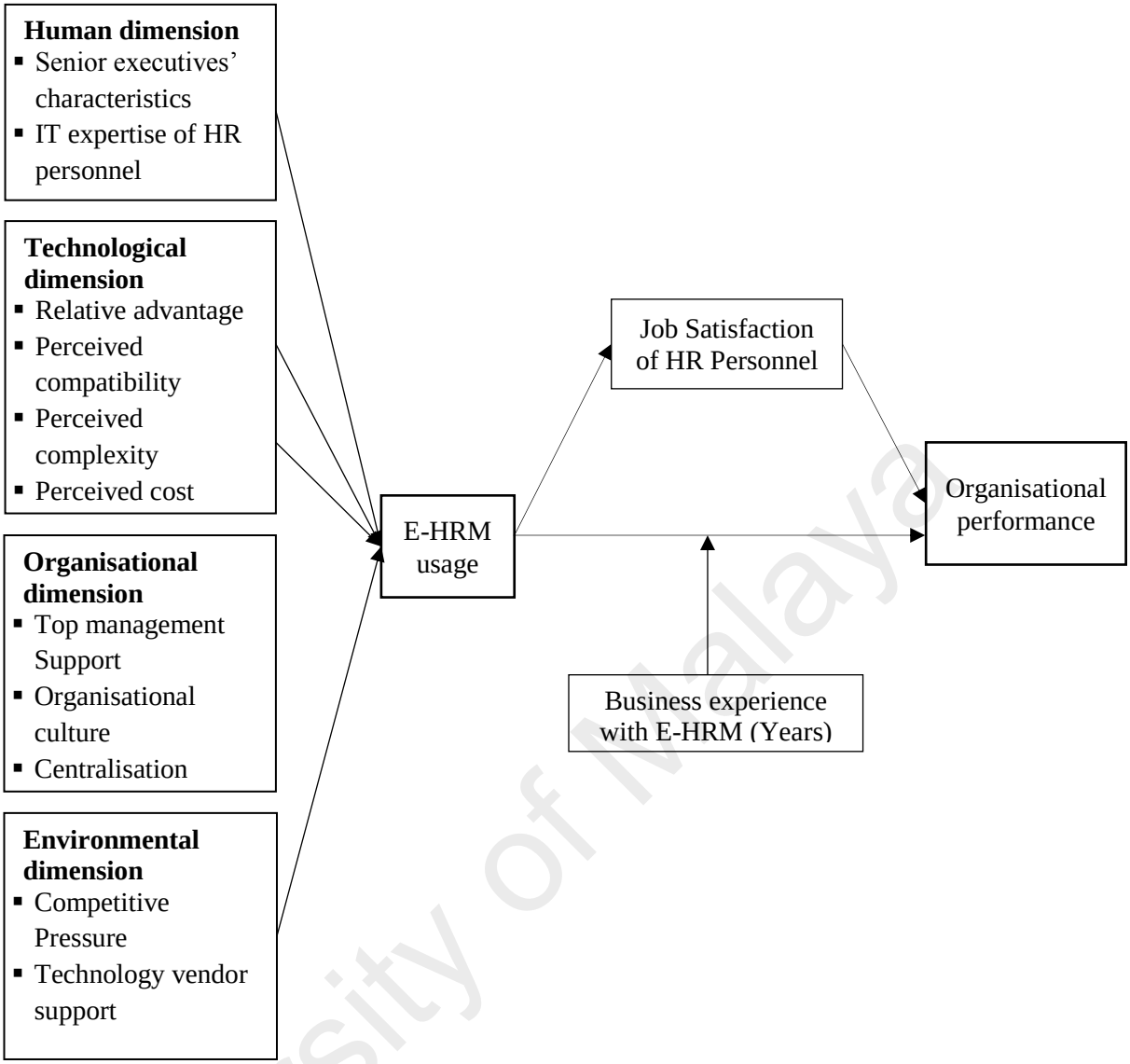


Figure 2.8: Proposed E-VALUE Model

2.14.1.1 Human dimension

The human dimension relates to human ability and interest to the IT applications. This dimension includes issues encountered by senior executives, including the Chief Executive Officer (CEO), Chief Information Officer (CIO) and employees. When organisations immerse in the adoption of an inventive technology, these issues can arise (Lian et al., 2014). This study explores two variables in this area, which include the senior executives' characteristics (innovativeness and IS knowledge) and the IT expertise of HR personnel. Scholars have argued that if an IT application is considered

useful, senior executives will have a positive attitude toward the implementation of that new system such as E-HRM (Ghobakhloo et al., 2011).

(a) ***Senior Executives' Characteristics***

Senior executives form the highest-level management within an organisation, and carry the power to allocate organisational resources. They are decision makers in organisations that control the organisational attitude with regards to innovation. This is mainly because these high-level executives usually are vital policymakers or the business owners (Alshamaila, Papagiannidis & Li, 2013). Kimberly and Evanisko (1981) set out three potential factors of innovation adoption: CEO characteristics, environmental characteristics and organisational characteristics. Later, Thong (1999) proposed four variables, which include CEO characteristics needed for IS adoption. Similarly, Ahmadi et al. (2015) attested that, with regards to the stance towards innovation of an organisation, CEO's or CIO's play a crucial role. The CEO's knowledge of IS and his or her innovativeness constitute two sub-issues within this context (Jeon, Han & Lee, 2006). According to a recent study, the degree of uncertainty for adopting new technologies will be reduced when the CEO has more knowledge about the matter (Thong & Yap, 1995). The same study also revealed that the characteristics of a CEO form important determinants that affect the decision of the adoption of IT in small businesses. When the CEO has more knowledge of IT, is more innovative and has a positive image of the IT adoption, these small businesses are more prone to adopt IT. Next to this, education of CEOs with regards to the benefits and functions of IT applications could make them more willing to adopt such technologies (Ghobakhloo et al., 2011). A study of HRIS in Jordanian hospitals conducted by Shannak and Nasser (2012) revealed that the more knowledgeable a CEO is, the more likely he or she will be open to adopt IS. The same study suggested that this increased level of knowledge will lower the degree of uncertainty for adopting IT applications.

Supporting this earlier research, Seif (2015) also revealed that CEO's IT knowledge as well as IT experience has a great impact on HRIS adoption decision in organisations of Kenya.

For a new technology adoption, another influencing element is innovativeness of senior executives. According to Rogers (1995), the time needed for a person to adopt and accept new ideas that are relative to those of other members within the same group can be defined as personal innovativeness. Agarwal and Prasad (1998) used this definition for research on IS, and extrapolated it further into the willingness to explore new IS. As can be seen in Table 2.6, earlier studies revealed that decisions regarding the adoption of new technologies are positively influenced by CEO innovativeness. Moreover, a contemporary study carried out by Al-Qirim (2008) revealed that CEO innovativeness also positively affects IT adoption in SMEs (small and medium sized enterprises) in New Zealand. In line with earlier research, a study carried out in Indonesia has shown that the IT ability and innovativeness of a business owner have a major influence on the decision to adopt IT applications (Rahayu & Day, 2015). Conversely, a few studies claimed that CEO's IT knowledge as well as their innovativeness does not affect IS adoption in organisations (Ahmadi et al., 2015; Lian et al., 2014).

Table 2.6: Past Research Findings on Senior Executives' Characteristics

Variable	Author(s) who found significant	Author(s) who found non-significant
Senior Executives' Characteristics	Agarwal and Prasad (1998); Alshamaila et al. (2013); Al-Qirim (2008); Ghobakhloo et al. (2011); Jeon et al. (2006); Rahayu and Day (2015); Sophonthummapharn (2009); Thong and Yap, (1995); Thong (1999)	Ahmadi et al. (2015); Lian et al. (2014)

Based on the aforementioned, it can be assumed that senior executives' characteristics (innovativeness and IS knowledge) will be a determinant for E-HRM usage in the organisations of Bangladesh.

(b) ***IT Expertise of HR Personnel***

IT expertise remains a vital factor with regards to the adoption of new technologies (Kwon & Zmud, 1987). According to Teo et al. (2007), it is important for HR personnel to posess a working knowledge of both IT as well as all HR functions: they need to be multidisciplinary. Numerous researchers attested that the availability of skilled HR personnel with IT expertise forms an essential component that affects the long term success and gradual growth of E-HRM within an organisation (Elliott & Tevavichulada, 1999).

Kwon and Zmud (1987) suggested that IT expertise can be considered as a factor to affect innovation adoption. In a recent study of Panayotopoulou et al. (2007), employees' IS capabilities is explored as an imperative factor for E-HRM innovation adoption. The recent research stated that employees who have both managerial and technical skills are considered as strength for an organisation, and this strength indicates technology readiness for any innovation adoption (Jaafar, Ramayah, Abdul-Aziz & Saad, 2007). More generally, the availability of technical skills is a pre-requisite for the implementation of E-HRM self-services. Since, Lau and Hooper (2009) reported that skilled personnel are more likely to independently handle IS-related jobs based on their previous experiences.

Innovation adoption is often delayed by organisations, mainly because they tend to delay this until they have sufficient technical expertise (Oliveira et al., 2014). This means that small organisations will be more likely to adopt IS when they have more IS knowledge within their own workforce. For successful IS innovation, Premkumar and

Roberts (1999) pointed out HR personnel need to understand the working knowledge of all HR functions and information systems. Askool and Nakata (2012) reported that the employees' IS proficiency was identified as a significant factor that affecting intention of CRM (customer relationship management) usage in Saudi Banks. However, some researchers found that employee IS capabilities or prior experience was non-significant factor for technology innovations adoption in different context (Al-Dmour, 2014; Low et al., 2011). Moreover, a substantial amount of research reported that personnel's technological competence was one of the most significant factors affecting IS adoption while a few research found opposite proposition (Table 2.7).

In the same way, it can be deduced that IT expertise of HR personnel will also have an impact of E-HRM usage in organisations in Bangladesh.

Table 2.7: Past Research Findings on IT Expertise of HR Personnel

Variable	Author(s) who found significant	Author(s) who found non-significant
IT expertise of HR Personnel	Aboelmaged (2014); Ahmadi et al. (2015); Askool and Nakata (2012); Al-Hameed et al. (2012a); Gutierrez et al. (2015); Kuan and Chau (2001); Lian et al. (2014); Bian (2012); Oliveira & Martins (2010); Oliveira et al. (2014); Teo et al. (2007); Troshani et al. (2011); Zhu et al. (2006)	Al-Dmour (2014); Al-Mobaideen, Allahawiah and Basioni (2013); Low et al. (2011)

2.14.1.2 Technological dimension

According to Tornatzky and Fleischer (1990), the original definition of the TOE framework encompasses both the internal as well as the external technologies that are relevant to an organisation. Later, Troshani et al. (2011) attested that the technology dimension relates to the extent to which adoption is influenced by technology characteristics. Thus, within the current capabilities of an organisation, the main definition relates to the operationalisation and potential realisation of benefits. Several

factors within the technology dimension can influence the likelihood of the adoption of new technologies. The adoption of IS within small businesses is mainly influenced by the factors of relative advantage, complexity and compatibility, according to Thong (1999). Moreover, Mirchandani and Motwani (2001) examined characteristics of technological content, most notably the cost of innovation. They reported that cost is one of the most significant factors in technology adoption. This can be particularly critical in developing countries, where the costs for manual labour usually is cheaper than the capital needed for (new) technology (Vatanasakdakul, Tibben and Cooper, 2004). Based on the above, this study aims to investigate the impact of the four main technological characteristics on organisations in Bangladesh: relative advantage, perceived compatibility, perceived complexity, and perceived cost on E-HRM usage.

(a) ***Relative advantage***

The relative advantage is supported by the innovation theories TAM (Davis, 1989) and DOI theory (Rogers, 1995). Even though the terms 'relative advantage' and 'perceived benefits' have been used interchangeably in the past, as to remain consistent, the term relative advantage is solely used this study. This term can be defined as the belief of certain benefits within the sphere of economic profitability, performance improvement, and savings in time and effort, costs reduction or in other ways (Clemons & Row, 1991). The relative advantage of E-HRM refers to the ways the efficiency of an HR department can be improved by E-HRM. This can be done by the automation of administrative task, the reduction of paperwork, the simplification of work processes and by distributing better information to management. The common benefits of E-HRM have frequently been cited in studies. Mentioned most often were the improvement of accuracy, the facility of quick and timely access to information and reduced costs (Al-Dmour, 2014; Teo et al., 2007). Many scholars indicated that the way in which organisations can dedicate more time to decision-making and strategic planning to be

the most important benefit of E-HRM. Next to this, the reduced time needed for the input of information and daily HR administration were also named as highly beneficial effects (Strohmeier, 2007).

Various researches indicated that relative advantage is one important factor in the adoption of technology (Table 2.8). For example, a study on the United Arab Emirates by Aboelmaged (2014) revealed that one of the key determinants of IT application is constituted by perceived benefits. This, as it involves determinants such as an organisations' enhanced competitiveness, an increase in efficiency and the effectiveness of information flows, and a reduced operation cost for technology. In addition, Lin (2014) indicated that the perception of an increased relative advantage with regards to the adoption of E-SCM is a predictor for the possible adoption of IS technologies in businesses in Taiwan. Consistent with prior studies, Chong and Chan (2012) revealed that in Malaysia, the perceived benefits of RFID (Radio-Frequency Identification) greatly impact the possible adoption and implementation of these technologies. With regards to the technology dimension, a study on HIS (Hospital Information System) has led experts to agree that the relative advantage is the single most important aspect as compared to other factors (Ahmadi et al., 2015).

In the past, relative advantage has been used as a common denominator to examine its impact on HRM usage. Teo et al. (2007) pointed out that, in Singaporean companies, decision to adopt HRIS is closely linked to a positive perception of advantages of HRIS for HR departments. Similarly, Al-Dmour (2014) suggested that, in Jordanian businesses, HRIS usage is impacted by the same perceived relative advantage. However, Bian (2012) found that in the context of Chinese firms, no influence of relative advantage on E-HRM adoption could be seen. Also, Al-Mobaideen et al. (2013)

reported that perceived relative advantage is not important factor on the successful implementation of HRIS.

Table 2.8: Past Research Findings on Relative Advantage

Variable	Author(s) who found significant	Author(s) who found non-significant
Relative Advantage	Aboelmaged (2014); Ahmadi et al. (2015); Ahmad et al. (2014); Al-Qirim (2008); Al-Dmour (2014); Chong and Chan (2012); Ghobakhloo et al. (2011); Gangwar et al. (2015); Lin (2014); Jeon et al. (2006); Oliveira et al. (2014); Low et al. (2011); Ngai and Wat (2006); Rahayu and Day (2015); Ramdani et al. (2013); Sophonthummapharn (2009); Teo et al. (2007)	Al-Mobaideen et al. (2013); Gutierrez et al. (2015); Hung et al. (2015); Lian et al. (2014); Bian (2012)

The above suggested that positive perception of advantages of technology innovation can stimulate companies in Bangladesh to implement E-HRM. Thus, it is expected that E-HRM perceived relative advantage will positively affect E-HRM usage in organisations of Bangladesh.

(b) ***Perceived compatibility***

Ghobakhloo et al. (2011) has suggested that the degree to which a modern technology is supposed to be consistent with a potential user's values, requirements, and previous experiences can be defined as compatibility. It is suggested that the perceived compatibility of an innovation is closely linked to the possible adoption of this innovation (Rogers, 1995). Tornatzky and Klein (1982) found that it becomes more likely for an innovation to be adopted when it resembles with a person's job responsibility and value system. The adoption not only depends on the compatibility with the cultural values that are deeply rooted in an individual, but also when it fits in with his or her previous ideas. This compatibility can either hamper or speed up the adoption rate of an innovation within the organisation. Moreover, the definition of

compatibility also includes the need for technology to align with a company's needs. This includes the harmonisation of a firm's IS strategy and its business strategy (Chong & Chan, 2012; Ramdani et al., 2013).

When new technologies are adopted, significant changes to the day-to-day work practices of a firm are brought about. Resistance to these changes can be seen as a normal organisational reaction (Premkumar & Roberts, 1999). Similarly, the HR department will see a more streamlined workflow and automatisation of routine tasks. Even though resistance is normal, it can greatly impede the adoption and implementation of HRIS (Al-Dmour, 2014). Ensuring that the changes are compatible with the infrastructure, values and beliefs of an organisation is of major importance. By ensuring that E-HRM is compatible with the current corporate system, work environment, practices, corporate values and beliefs, the company will tend to adopt E-HRM.

There is a large volume of published studies describing the role of compatibility (Table 2.9), and they consider it as an essential factor of IS/IT adoption. For instance, in 110 small Singaporean firms, Teo et al. (2007) found that the adoption of HRIS is highly influenced by the compatibility of said innovation. Similarly, in a study on 235 Iranian SMEs conducted by Ghobakhloo et al. (2011), compatibility was considered as the main factor of importance in the adoption phase of IT applications. Bian (2012) found compatibility with existing work application systems to be a major factor of E-HRM adoption in Chinese firm. However, some scholars have indicated that compatibility does not affect innovation adoption (Table 2.9).

Based on above discussion, we can consider that the perceived compatibility of E-HRM with an organisation's objectives, IS environment, and work practice will be positively related to its adoption. In this study, perceived compatibility was measured

by the existing norms and values of potential users, as well as their previous practices and current information systems of the organisations.

Table 2.9: Past Research Findings on Perceived Compatibility

Variable	Author(s) who found significant	Author(s) who found non-significant
Perceived compatibility	Ahmad et al. (2014); Al-Dmour (2014); Alshamaila et al. (2013); Chong and Chan (2012); England and Stewart (2007); Gangwar et al. (2015); Ghobakhloo et al. (2011); Bian (2012); Ramdani et al. (2013); Sophonthummapharn (2009); Teo et al. (2007)	Ahmadi et al. (2015); Gutierrez et al. (2015); Hung et al. (2015); Low et al. (2011); Lian et al. (2014); Oliveira et al. (2014); Rahayu & Day (2015)

(c) ***Perceived complexity***

The degree to which a technological modernisation is perceived as being relatively challenging to know and utilise is referred to as perceived complexity (Rogers, 1995). Scholars have argued that the more challenging a new technology is perceived to be, the less likely it is to become adopted. Researchers attested that the perceived complexity initiates risks and greater uncertainty to a successful implementation of a technology (Premkumar & Roberts, 1999). Hence, the likelihood of adoption increases when the integration of a new technology is perceived as easier. It has also been suggested that resistance usually arises due to a lack of technological expertise and IS specialists, since this increases the perceived complexity (Oliveira et al., 2014; Ramdani et al., 2013).

Many HR departments have been taking their time to adopt E-HRM. This is mainly because understanding and using HR information systems remains difficult for non-technical staff (Al-Dmour, 2014). In companies that have adopted E-HRM, the usage remains limited. This is mainly due to the fact that modification of the system requires intervention from the IT department (Bian, 2012). Researchers have proclaimed that new information systems have to be user friendly and simple to use in order to increase

their adoption rate (Alshamaila et al., 2013). This point of view is supported by Berman, Kesterson-Townes, Marshall and Srivathsa (2012), who stated that the adoption rate of new technologies can only be increased when they are manageable and easy to use.

Ample research has been done in technology adoption (Table 2.10), where complexity was identified one of the most essential factors. For example, Al-Dmour (2014) found that complexity is a significant factor for HRIS implementation in Jordan. In the same vein, Gutierrez et al. (2015) revealed that, in the UK, perceived complexity has an influence on the adoption decision of cloud computing services. Similarly, Ramdani et al. (2013) also found a negative relationship between perceived complexity and decision to adopt ERP in SMEs of the northwest of England.

Conversely, Teo et al. (2007) surveyed some manufacturing firms through all Singapore to identify the discriminant factors between adopter and non-adopter of HRIS. They found complexity as a non-discriminant factor among the firms. Consistent with prior studies, Bian (2012) revealed that perceived complexity is a non-significant factor for E-HRM adoption decision in china's firms. In the same way, some studies on IS adoption reported that perceived complexity is not found as an important factor (Table 2.10).

Contradicting results regarding the relationship between perceived complexity and E-HRM adoption in organisations require further investigation. Hence, the present study incorporates the variable to explore the influence of perceived complexity on the organisational adoption of E-HRM among organisations in Bangladesh.

Table 2.10: Past Research Findings on Perceived Complexity

Variable	Author(s) who found significant	Author(s) who found non-significant
Perceived Complexity	Al-Dmour (2014); Chong and Chan (2012); England & Stewart (2007); Gutierrez et al. (2015); Gangwar et al. (2015); Oliveira et al. (2014); Ramdani et al. (2013)	Alshamaila et al. (2013); Ahmadi et al. (2015); Al-Qirim (2008); Ahmad et al. (2014); Bian (2012); Low et al. (2011); Sila (2013); Teo et al. (2007)

(d) ***Perceived Cost***

For any new technology, the cost of adoption plays an important role in its adoption and utilisation. Usually, when an organisation is trying to decide on whether or not to adopt a new technology, a cost-benefit analysis is made. In most cases, lower costs translate into a higher likelihood of a fast adoption (Iacovou, Benbasat & Dexter, 1995). Next to this, innovation costs usually impact the adoption of an innovation in a negative way (Premkumar & Roberts, 1999; Tornatzky & Klein, 1982). For technology innovation, usually administrative and implementation costs are included (Hung et al., 2015). Other factors that can be of influence with regards to these costs are operating costs, setup costs and training costs that are linked to the usage of the IS application (Teo et al., 2009). Firms that do not have the financial resources to invest in this, or those that view these costs to be high will be less likely to invest in the adoption of IS applications (Lin, 2014).

Various IS researchers have studied the cost factor. They have found a direct and significant association between the cost and adoption of new information systems (Table 2.11). A study conducted by Ghobakhloo et al. (2011) on the adoption of e-commerce systems in SMEs in Iran revealed that the financial aspect (high costs) is the sole reason for not adopting e-commerce applications. In the same vein, Chong and Chan (2012) explored the factors that influence the adoption of RFID in the healthcare industry. Here too, cost was found to be the most important determinant. Chong also

argued that, instead of focusing on short-term costs, healthcare firms should consider the long-term return on investments when deciding on the implementation of new technology. Moreover, Sila (2013) found that perceived cost was a key factor affecting the decision for adopting business-to-business e-commerce in North American firms.

In contrast, for Korean SMEs, the adoption costs do not seem to be a major factor in the decision to adopt e- commerce (Jeon et al., 2006). Similarly, a study of the adoption of e-commerce and IT applications by Al-Qirim (2008) concludes that perceived cost did not play any significant role in e-commerce implementation in SMEs in New Zealand. Another study on SMEs in Indonesia revealed that e-commerce adoption is only marginally influenced by the perceived benefit. This would mean that the perceived cost does not constitute a determining factor for the adoption process (Rahayu & Day, 2015). Likewise, some researchers attested that perceived cost was non-significant factor for their IS adoption research (Table 2.11).

Table 2.11: Past Research Findings on Perceived Cost for IS Innovations

Variable	Author(s) who found significant	Author(s) who found non-significant
Perceived Cost	Chong (2004); Chong and Chan (2012); Clark and Saunders (1992); Kuan and Chau (2001); Iacovou et al. (1995); Lin (2014); Sila (2013)	Al-Qirim (2008); Ghobakhloo et al. (2011); Jeon et al. (2006); Hung et al. (2015); Rahayu and Day (2015); Teo et al. (2009)

From the above discussion, it can be deduced that perceived cost of E-HRM has a great influence on the organisational adoption of E-HRM among Bangladesh's organisations.

2.14.1.3 Organisational dimension

Organisational factors, which refer to the structure and process of an organisation, can either constrain or facilitate the adoption or implementation of innovations (Cao, Jones & Sheng, 2014). Attributes that have most often been investigated in previous

research are the organisational dimension factors (Hameed et al., 2012a). There are several factors related to the organisational context that influence new technology adoption. Grover (1993) has published an important work that focuses on the adoption of Customer-based Inter-organisational Systems. He grouped the organisational factors into four categories: centralisation, infrastructure, size and top management support. Furthermore, Bian (2012) added two more. Moreover, Premkumar and Roberts (1999) considered three organisational variables in their study of small businesses in the United States. These were top management support, organisational size and IT expertise. In addition, Ngai & Wat (2006) and Panayotopoulou et al. (2007) considered organisational culture as an organisational factor of HRIS adoption. In this study, the organisational dimension represents different organisational conditions. They include, but are not limited to, variables such as top management support, organisational culture and centralisation.

(a) ***Top Management Support***

Initially, Premkumar and Ramamurthy (1995) reported that, with regards to the decision making on the adoption of inter-organisational systems, top management support plays a major role. The willingness of the executive (or top level management) to provide the resources, authority or power that are crucial for the success of an IS or IT project is defined as top management support (Sila, 2013). With support from top management, it becomes relatively easy to increase the level of awareness on information systems within the organisation and to obtain financial resources. This is vital in order to attain the required infrastructure and skills, as well as to train personnel (Bian, 2012). The higher the top management's support is, the more likely it will be for organisations to overcome obstacles that are encountered during the adoption process. Stirpe, Trullen and Bonache (2013) argued that E-HRM introduced by the HR department that does not receive top management support is likely to gain little

acceptance, no matter how well designed these are, or how well these address the needs of the organisation and its employees. Moreover, Shrivastava & Shaw (2003) argued that large-scale technology projects, more often than not, fail due to managerial reasons, and not technical reasons.

A study performed with data from 13 European countries, conducted by Panayotopoulou et al. (2010), argued that there are multiple factors that influence the adoption of E-HRM, and that this is region-specific. The authors argued that all initiatives will fail when there is no support from top management. Troshani et al. (2011) argued that commitment from management deeply impacts the success of a possible E-HRM adoption. A study conducted by Teo et al. (2007) on the adoption and diffusion of HRIS in Singapore found that top management support constitutes the only significant factor in this. Ngai and Wat (2006) argued that, in order to attain adequate resources needed to set up a successful HRIS system, top management needs to take primary responsibility in providing financial support. When adequate resources and financial resources are lacking, this will inevitably lead to failure. Moreover, a vast array of studies have pointed out that top management support is a key issue in technology adoption (Table 2.12).

Table 2.12: Past Research Findings on Top Management Support

Variable	Author(s) who found significant	Author(s) who found non-significant
Top management support	Al-Dmour (2014); Alshamaila et al. (2013); Chong and Chan (2012); Gangwar et al. (2015); Hameed et al. (2012a); Lian et al. (2014); Lin (2014); Li, Pillutla, Zhou and Yao (2015); Bian (2012); Low et al. (2011); Ngai and Wat (2006); Oliveira et al. (2014); Ramdani et al. (2013); Sila (2013); Teo et al. (2009); Teo et al. (2007); Troshani et al. (2011)	Al-Mobaideen et al. (2013); Ahmadi et al. (2015); Hung et al. (2015); Gutierrez et al. (2015)

Conversely, Al-Mobaideen et al. (2013) found that top management support is a non-significant factor for HRIS implementation in Jordan. In the same way, various studies on IS adoption have concluded that top management support is not regarded to be a major factor (Ahmadi et al., 2015; Gutierrez et al., 2015; Hung et al., 2015).

Based on the above discussion, it can be expected that it will be more likely for a company to adopt E-HRM when there is support from top management.

(b) ***Organisational Culture***

By offering culural indicators as attributes that influence a person's the perceived usefulness and perceived ease of use, Veiga, Floyd and Dechant (2001) combined cultural issues with TAM and linked these cultural indicators to the use of information systems. Organisational cultures that are more likely to successfully deploy new technologies generally demonstrate a supportive climate and flexible structures. This stands in stark contrast to firms that have a more rigid, more mechanic culture (Ramdani et al., 2013). Generally, the unique social and psychological environment of an organisation is what makes up the organisational culture. It includes all expectations, experiences, philosophies and values that make up the identity of an organisation, and that bind it together. It is rooted in shared attitudes, beliefs and values, custom and norms (Li et al., 2015). Moreover, organisational culture also presents people with a general structure of orientation for changes in a company. When companies have different cultures, people have diverse opinions and understandings about organisational changes, which consequently influence staffs' willingness to accept changes (Ngai & Wat, 2006). Jackson (2011) stated that culture is becoming increasingly important within organisations. This, as groupware applications and ERP are becoming more important, and more and more internet based systems are being deployed. It is worth

mentioning these systems factors support cross collaboration at all levels, and on top of that require greater participation from inside the organisation.

As a result, organisational culture was identified as a critical factor for the success of projects relating to any organisational changes, such as the implementation of an E-HRM system (Seif, 2015). Organisational culture has proven to be an important factor in IT management processes and the management of new IS development projects (Chou, 2003). Many scholars highlighted the variable as a significant factor for IS adoption (Table 2.13). Taking on a more specific view, Panayotopoulou et al. (2007) claimed that the successful implementation of E-HRM is largely dependent on a change-oriented organisational culture. Mayfield, Mayfield and Lunce (2003) stated that organisational culture significantly impacts factors of HRIS implementation. With regards to the development and implementation of information systems, Indeje and Zheng (2010) proclaimed that organisational culture remains a critical success factor. Organisational culture can be a critical success factor for the development and growth of information systems by supporting linkages between technology adoption and organisational growth.

In addition, Cooper (1994) recommended that when an information system clashes with a company's culture, either the software will be abandoned or the software will be customised so that it matches the current organisational culture. Among the cultural elements, information sharing culture accelerates the IS adoption (Al-Dmour, 2014). When a firm adheres to an information-sharing culture, this strengthens top manager's beliefs in communication, open mindedness, trust and care. These attributes are important for the sharing of information between an organisation's various functional divisions. Top managers are likely to support the use of information software that results in high volumes of information being shared and causes a higher degree of

integration among business processes. In a study on China, Li et al. (2015) proclaimed that, with regards to the adoption and continuation of e-procurement software, the information sharing culture is one of the most significant influencing factors. In contrast with the aforementioned studies, in Singaporean firms, the adoption of new technologies seems to be less dependent on the sharing of information within a firm (Teo et al., 2009).

Based on the above, it can be expected that a more supportive business climate and flexible organisational structure that is more likely to share information will be more prone to adopt E-HRM innovation.

Table 2.13: Past Research Findings on Organisational Culture

Variable	Author(s) who found significant	Author(s) who found non-significant
Organisationalal Culture	ALdayel, Aldayel and Al-Mudimigh (2011); Chou (2003); Jackson (2011); Indeje and Zheng (2010); Li et al. (2015); Panayotopoulou et al. (2007); Mayfield et al. (2003)	Teo et al. (2009)

(c) ***Centralisation***

Previous research has found that a centralisation of decision making can enhance the process of technology adoption and can diminish conflicts amongst different departments within an organisation (Pierce & Delbecq, 1977). Similarly, Etllie, Bridges and O'Keefes (1984) argued that a more centralised organisational structure will make it more likely for a business to adopt new technologies. Several studies have pointed out the effects of a highly centralised design on organisations within this context (Al-Dmour, 2014). It can lead to more effective end user computing, as well as to more strategic IS applications being adopted successfully (King & Sabherwal, 1992). Furthermore, Zmud (1982) found that the positive associations of initiation, adoption

and implementation of incompatible technical innovations are closely linked to the concept of centralisation. In contrast with the aforementioned studies, Grover and Goslar (1993) has suggested that the negative relationship often seen between centralisation and adoption is due to its "decreased autonomy and bounded perspective". Similarly, Williams, Magee and Suzuki (1998) indicated that a centralised organisational structure is a non-significant factor, negatively related to certain dimensions of EDI (Electronic Data Interchange) participation.

In organisations where a high level of centralisation is exhibited, the adoption of technology can be facilitated. This, as top management can make decisions regarding this without being hindered by resistance from lower level managers or employees (England & Stewart, 2007). Troshani et al. (2011) discovered that the HRIS adoption can be facilitated by organisations that show this high degree of centralisation. Many scholars highlighted the variable as a significant factor for IS adoption (Table 2.14). However, in a meta-analysis of the relationship between organisational attributes and IS adoption in organisations, centralisation was identified as aha non-significant factor for IS adoption (Hameed et al., 2012a). In the same vein, Askool and Nakata (2012) stated that the high degree of centralisation is likely reducing the level of adoption intention towards CRM in Saudi Banks. Similarly, Al-Dmour (2014) also revealed that centralisation is not an important factor for HRIS adoption and implementation in Jordanian firms.

Table 2.14: Past Research Findings on Centralisation

Variable	Author(s) who found significant	Author(s) who found non-significant
Centralisation	England and Stewart (2007); Etllie et al. (1984); Pierce and Delbecq (1977) Troshani et al. (2011); Zmud (1982)	Al-Dmour (2014); Askool and Nakata (2012); Hameed et al. (2012a); Gatignon and Robertson (1989); Grover and Goslar (1993); Williams et al. (1998)

In the same way, it can be deduced that centralisation will also have an impact of E-HRM usage in organisations of Bangladesh.

2.14.1.4 Environmental Dimension

Environmental dimension is referred to as external factors (Hameed et al., 2012a). Some prior research in developing countries indicate that factors related to environmental dimension has a vital role factors related to organisational and technological dimensions (Ghobakhloo et al., 2011). In this research stream, two major factors are thoroughly examined: external pressure and external support (Sophonthummapharn, 2009). Any kind of pressure that can potentially affect an adoption decision can be seen as external pressure. An example of this is competitive pressure. External support can be defined as the support originating from other businesses that can affect adoption decisions. An example of this is the support from a technological vendor. In the available literature on IS adoption, competitive pressure has been widely recognised and empirically supported as one of the main factors in the environment context of the TOE framework (Cao et al., 2014). Moreover, technology vendor support plays a vital role in influencing organisations to adopt technologies (Chang, Hwang, Hung, Lin & Yen, 2007). With regards to the above, the following two variables of environmental dimension are included in the present study: competitive pressure and technology vendor support.

(a) ***Competitive Pressure***

Competitive pressure defines the degree of force that a company is subjected to that is coming from competitors within the industry (Lin, 2014). Many studies have defined competitive pressure as playing a key factor for firms to decide upon acceptance a new technology. Competitive pressure has been widely accepted and empirically supported as one of the major factors in the environmental dimension of the TOE framework

(Tornatzky & Fleischer, 1990) in IS adoption literature. Cao et al. (2014) argued that a competitive pressure forces a business to seek competitive advantage. This can be done by adopting new innovations: this shows a presence of a threat of losing competitive advantage. Moreover, emphasising the significance of competitive pressure as a strong incentive and adoption factor, competitive pressure can be seen as correlated to the intensity and pressure levels that are coming from competitors from the same industry (Gutierrez et al., 2015).

It has been indicated that competitive pressure serves as a key determinant in regards to an organisation's acceptance of new technology, as well as its readiness to adopt it. For instance, Ghobakhloo et al. (2011) suggested that competitive pressure (i.e. the pressure coming from the threat of a diminishing competitive advantage) is one of the key factors that determines IS strategies within an organisation. Within the context of small businesses, Bian (2012) found that competitive pressure was an important determinant of E-HRM usage amongst businesses in China. In line with previous studies, research conducted on 280 companies in the IT, manufacturing and finance sectors in India identified that competitive pressure is a crucial determinant with regards to cloud computing diffusion (Gangwar et al., 2015). Similarly, numerous studies reported competitive pressure as a major contributor to any technology adoption, while some researchers confront its significance in the adoption of innovation (Table 2.15).

Based on the above discussions, we can assume that, in order to keep competitive advantage, the external factor of competitive pressure will lead organisations in Bangladesh to adopt E-HRM.

Table 2.15: Past Research Findings on Competitive Pressure

Variable	Author(s) who found significant	Author(s) who found non-significant
Competitive Pressure	Al-Dmour (2014); Al-Qirim (2008); Askool and Nakata (2012); Chong and Chan (2012); Ghobakhloo et al. (2011); Gutierrez et al. (2015); Gangwar et al. (2015); Lin (2014); Bian (2012); Oliveira and Martins (2010); Low et al. (2011); Ramdani et al. (2013); Sila (2013); Sophonthummapharn (2009); Zhu and Kraemer (2005); Zhu et al. (2006)	Ahmadi et al. (2015); Aboelmaged (2014); Ahmad et al. (2014); Alshamaila et al. (2013); Jeon et al. (2006); Lian et al. (2014); Oliveira et al. (2014); Pan and Jang (2008); Rahayu and Day (2015); Teo et al. (2007)

(b) ***Technology Vendor Support***

Technology vendor refers to suppliers that deliver IT-related goods and services to other companies (Chang et al., 2007). Following the IT literature, small firms are suffering from absence of internal IT professionals and striving in hiring external IT experts (Ahmadi et al., 2015). Small firms often suffer from financial constraints, due to which they cannot afford the hiring costs of external IT expertise that can provide training to workforce and which can guide them through the IT adoption (Thong & Yap, 1995). Therefore, technology vendors are of major influence for the adoption of IT within SMEs, and can be considered to be the most important source of external expertise regarding IT applications (Rahayu & Day, 2015). Moreover, it can be assumed that owners and/or CEOs of small firms that receive the support required for IT adoption through their technology vendors are more likely to adopt and utilise these technologies (Ghobakhloo et al., 2011).

These are some of the reasons that show why it is evident that the technology vendor support is a significant factor at every stage of the IT implementation project. Plant and Willcocks (2007) claimed that vendor support facilitates the information system implementation success through the external perspectives and knowledge that they

have. Somers and Nelson (2004) also stated that technology vendor support, in the form of emergency maintenance, comprehensive technical support, upgrades and updates, and particular user training, is a vital factor for IT applications during the implementation processes. Sophonthummapharn (2009) classified three dimensions of vendor support, which are response time of the services, qualified staff with knowledge of both the enterprise's business processes and IT, and participation in implementation of IT applications.

As discovered by earlier research, the support from technology vendors is of influence for the adoption of technology (Table 2.16). For instance, in a study of e-CRM (electronic customer relationship management) conducted by Sophonthummapharn (2009), it was suggested that the convenience of technology vendors support is a significant factor in decision to adopt the IT application for businesses in Thailand. A study by Ghobakhloo et al. (2011) on small firms in Iran has shown that the main source of external IT expertise is found in support from technology vendors, and that this constitutes a major factor that influences IT adoption. In the same vein, Al-Dmour (2014) claimed that, in Jordanian firms, the availability of IT suppliers and their backing is the most significant factor in environmental dimension for adopting HRIS. Within the domain of small businesses, Alshamaila et al. (2013), who concentrated his study on firms in the north-east of England, found that the adoption of cloud computing in this area was significantly affected by technology vendors' support. In contrast with the aforementioned studies, Ahmadi et al. (2015) did not find adequate proof for vendor support being an important determinant for adopting IS applications in Malaysian hospitals. Regarding New Zealand, Al-Qirim (2008) reported that SMEs in this country regarded technology vendors as not assisting in the adoption of extranet. The SMEs would lack the competence to come up with proper technical advice for the adoption of these technologies, and to promote their e-commerce solutions actively.

Table 2.16: Past Research Findings on Technology Vendor Support

Variable	Author(s) who found significant	Author(s) who found non-significant
Technology Vendor Support	Al-Dmour (2014); Alshamaila et al. (2013); Chang et al. (2007); Costa, de Oliveira and de Oliveira Machado (2004); Ghobakhloo et al. (2011); Sophonthummapharn (2009)	Ahmadi et al. (2015); Al-Qirim (2008); Rahayu and Day (2015)

Therefore, from the above it can be deduced that firm owners/CEOs may be motivated to adopt IT applications such as E-HRM if they receive adequate support from technology vendors. Thus, it is expected that vendor support for E-HRM applications will positively affect the usage of E-HRM in organisations in Bangladesh.

2.14.2 Business Experience with E-HRM

This study investigates the usage of seven E-HRM applications and the value created by these applications. In this study, the definitions of E-HRM adoption, E-HRM usage and E-HRM implementation are used interchangeably.

Kauffman et al. (2002) examined how the evolutionary game theory is used by firms to sustain themselves. They found that, by taking on an experimental approach, which allows firms to learn through process of a trial and error, businesses could gain knowledge on the profit-generating strategies that worked. Similar to the mutation process, firms realised what worked better by exploration, experimentation, examining the reaction of market and financial performance, as well as gaining information from competitors' experience (Kauffman et al., 2002). Realising this, business experience with E-HRM usage was believed to have strong contingent effect on E-HRM usage (independent variable) – organisational performance (dependent variable) relationship. Therefore, this study tried to find how the presence of moderating variable modified the "E-HRM usage – organisational performance" relationship.

Here, the measurement of moderating variable (Business experience with E-HRM) was based on the time length an organisation engaged in E-HRM for its HR activities. The basis used in measuring length of time was based on the number of years.

2.14.3 Job satisfaction of HR Personnel

In a TAM theory, it is stated that the perceived ease of use and perceived usefulness of a system are two important factors that affect system users (Davis, 1989). Researchers attested that user behaviour is influenced by the user´s perception, which affects their attitudes as well as their intention to use (Maier et al., 2013). Scholars stated that employees' job satisfaction, work performance and organisational commitment are all affected by system security, usability and efficiency with regards to system quality (Chang et al., 2012). With the same thought, Maier et al. (2013) employed job satisfaction of HR personnel as a mediating variable in their HRIS implementation research. They provided empirical evidence on fully mediating effect of job satisfaction of HR personnel on the relationship between users' attitudes towards the HRIS system and turnover intention. It proves that HR personnel's attitude towards the HRIS has direct and indirect effect on their turnover intention.

With regards to job satisfaction for system use, when employees perceive a system to be having a high ease of use and usefulness, they will feel encouragement to use the system and will have a positive attitude towards the system (Davis et al., 1989). Similarly, the ease of use and usefulness of a system as perceived by users (employees and managers) allow them to gain support at work. Consequently, their work quality and productivity are increased. This can lead to them being more devoted to their job, and to make them participate more actively in job-related activities (Chang et al., 2012).

The tasks, routine processes, and capabilities of HR employees undergo changes during the transformation of the HR department, which is becoming more of a strategic

partner as opposed to an administrative department (Al-Dmour, 2014). When an individual regards a change as negative and/or as a threat, his or her intention to quit increases (Cunningham, 2006). Moreover, since working in a threatening environment is dissatisfying to employees, one's job satisfaction may decline (Cunningham, 2006). Thus, job satisfaction of personnel and their turnover intention are influenced by the individual's attitude towards organisational change.

The perception that employees have regarding the impact of a new IS always has consequences that are work-related. Maier et al. (2013) illustrated both the anticipated as well as the unanticipated consequences of HRIS usage for HR personnel. Moreover, it has been found that the more difficult the HRIS system is to use, the more employee satisfaction declines (Beckers & Bsat, 2002). A reason for this could also be a declining work motivation, which affects job satisfaction in a negative way as well (Singh, 1998). In addition, HRIS system usage requires a change of work practices and adjustment to a new workflow (Wiblen et al., 2010). Getting acquainted with new job routines that are necessary to work with HRIS will initially generate a higher workload and additional stress. This is one of the reasons for employees to see the new system in a negative light, since one usually prefers to stick to routine and keep the same business processes (Ngai et al., 2008). This in turn may lead to lower levels of job satisfaction during the process of HRIS implementation. Based on previous literature, it can be assumed that E-HRM usage has an influence on job satisfaction of HR personnel, and job satisfaction has also impact on organisational performance.

2.14.4 Measuring Organisation Performance with E-HRM

For any business, the main strategic objective is to attain higher financial performance or the maximisation of profits for its shareholders (Becker & Huselid, 1998). However, this is all depending on the degree to which a higher organisational

performance can be attained (Delaney & Huselid, 1996). Organisational performance is generally measured by means of the following indicators:

- Effectiveness: the way in which an organisation attains its goals/objectives (Dyer & Reeves, 1995).
- Efficiency: the extent to which the organisation succeeds in utilising a minimum of resources in order to reach its objectives (Dyer & Reeves, 1995; Rogers & Wright, 1998).
- Development: the extent to which the organisation develops itself in order to meet future challenges and opportunities (Phillips, 1996).
- Satisfaction: measured for all stakeholders except HR employee (Delaney & Huselid, 1996).
- Innovation: with regards to products and processes (Guest, 2001).
- Quality: the percentage of goods or services that is of high quality (Delaney & Huselid, 1996; MacDuffie, 1995).

Katou and Budhwar (2006) investigated the impact of HRM systems (expressed by content, process and climate) on organisational performance. In order to examine organisational performance, they measured effectiveness, efficiency, development, satisfaction, innovation and quality in HR activities. In this study, organisational performance was measured following Katou and Budhwar (2006) instrument. Here, effectiveness indicates meeting the organisational objectives through E-HRM, whereas efficiency indicates using the least amount of human resources possible in order to meet objectives. Development is used as an indicator that points out the way in which the capacity of human resources is enhanced in order to meet future challenges and opportunities. Satisfaction indicates the satisfaction of stakeholders, suppliers and customers in terms of HR activities, whereas innovation indicates products and HR

processes. Lastly, quality indicates the percentage of products (different types of schemes) that are of high quality.

2.15 Chapter Summary

This chapter describes the definition of E-HRM, the difference between E-HRM and HRIS, E-HRM applications in organisations of Bangladesh, and current E-HRM research trend in Bangladesh. A discussion on IT adoption theories and current research trends are incorporated. A multidimensional perspective of theoretical model is developed by combining five widely used theories/models i.e. TOE framework, HOT-fit model, evaluation game theory, TAM, and RBV theory. Given the direct and indirect effects of moderator and mediator, the data regarding the adoption and post-adoption of E-HRM and the unbiased perspectives of constructs, dimensions as well as elements from both the IT and business perspectives, some expectations could be outlined. Based on the above, it was expected that the E-VALUE model is capable to seal the knowledge gaps exited in earlier studies by answering the research questions of the present study.

CHAPTER 3: RESEARCH DESIGN AND METHODOLOGY

3.1 Overview

In the earlier chapter, a basic difference between HRIS and E-HRM, and present research on E-HRM in Bangladesh were incorporated. Moreover, an extensive literature was surveyed on E-HRM and related IT adoption, prior theories on IT adoption, and value creation of IT application usage. Based on knowledge gaps an E-VALUE model is proposed to achieve the objectives of the study. This chapter is begun with discussing the research design basing on this study which included explanations regarding research paradigm, research approach, and research methodology in section 3.2. Moreover, the selection method of target population and sampling method are explained in sections 3.3 and 3.4. In section 3.5, the theoretical framework of current study is depicted carefully. Subsequently, operational definitions are described for measuring the research variables in section 3.6. In section 3.7, the research hypotheses are developed. Furthermore, the procedure of survey instrument design and its validity and reliability methods are also highlighted in section 3.8 and 3.9. A brief step of pilot study is discussed in section 3.10. Moreover, section 3.11 describes the questionnaire distribution process and its outcome. Ultimately, the relevant data analysis techniques which are apposite to the current study are presented in section 3.12.

3.2 Research Design

Research approaches are typically classified as both quantitative and qualitative (Neuman, 1997). The quantitative approach describes the scientific empirical practice, while the qualitative approach denotes naturalistic phenomenological method (Burns, 1997). According to Yauch and Steudel (2003), 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 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 analysed 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, qualitative approach usually follows inductive method. 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 respondents via mail, face-to-face, or nowadays via e-mail. 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 modelling.

Qualitative approach was not adopted for this research. Most importantly, 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. So, this study is oriented towards quantitative approach for the following reasons. Firstly, 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 IT adoption and other related theories which possibly will be either accepted or rejected according to statistical results and analyses.

Questionnaire survey was employed in this study for collecting information about factors affecting adoption decision of E-HRM, and level of E-HRM applications usage and its impact on organisational performance. To achieve anonymity and to avoid biasness, structured questionnaire survey, that is self-administered, was used. Here, a survey method was employed as the sampled elements and the research variables were perceived as they are without making any effort to control, influence, or manipulate them. This study is aimed at testing variety of hypotheses as wells as investigating the hypothetical associations of some of the factors and the management decision of E-HRM usage, and relationship among E-HRM usage and organisational performance. 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 a research. In this study, the kind of the present analysis is correlational naturally. The 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.

The data used in this study were collected primarily from a questionnaire developed from the past literature. After the conceptual model of the study was confirmed and the questionnaire was designed accordingly, a pilot study was conducted for an initial examination of the instruments and further modification of the questionnaire items. Later, a final questionnaire was developed. Data of this study was collected from a group of employees of each selected organisation which has E-HRM usage experience in Bangladesh. The surveys were administered in English and Bengali, and printed questionnaires were distributed by hand with the assistance of the Human Resource Personnel of each organisation. A total of 665 questionnaires were circulated to the selected organisations in Bangladesh.

Research can be conducted in a way that data are collected only once after a long period of maybe days, weeks or even month, so as to find the aim of this study. These kinds of study are named cross-sectional or one-shot research. This study was regarded as a cross-sectional study that data collection was done for over a four-month period from September up to December 2015.

3.3 Population and Unit of Analysis

Target population or population of interest is the group of individuals that the researcher wishes to carry out investigations on (Hair, Black & Babin, 2010). Based on the current research, influential factors for the E-HRM usage are examined in the various companies of Bangladesh that incorporated the E-HRM system. Thus, E-HRM user organisations in Bangladesh are the target population regarding this particular study. An element refers to one member of the population. In this research, an element refers to a single E-HRM using organisation in Bangladesh. The responding companies should have E-HRM applications and the exceptional companies that had this requirement were considered. An E-HRM using organisation was the one that has background information of implementing about four E-HRM modules. Seven E-HRM modules were identified based on prior studies. These modules are recruitment and selection, payroll and compensation management, training and development, employee performance appraisal, HR planning, internal communication, and employee self-service portal.

Sekaran and Bougie (2010) said that the main aim of the study is to find out the unit of analysis. This current finding scrutinizes the significant factors affecting E-HRM usage at the organisational level and the effects of the E-HRM utility regarding the performance of organisations at Bangladesh. Although, past studies argued that IS implementation success depends on user satisfaction and also the user's perception

about the IS project outcomes in their organisations. Therefore, the present unit of analysis turns out to be the E-HRM users based on targeted organisations. This is consistent with prior relevant research in the literature (Dezdar, 2011). Choosing an organisation's outstanding respondents is relevant concerning the innovation surveys. This happens since the enquiries are specialised and therefore can only be responded to by a few people in the organisation. Moreover, a proper completion of the questionnaire requires reliable knowledge of the technology as well as of the market conditions in a certain line of business (Harabi, 1995). Furthermore, it is important to define not only the unit of analysis, but also the respondents representing the unit of analysis (Hair et al., 2010). Consequently, important organisational informants that comprise of three-level of HRM managers were selected as respondents. This particular category of respondents is considered as the most knowledgeable informants in the organisations based on the E-HRM usage and its impact on organisational performance.

This study employed multiple respondents selected from different levels of management. Thus, if just one E-HRM user in each E-HRM user organisation was examined, it could be possible to have single respondent bias (Hong & Kim, 2002). An assertion by Ifinedo (2007) indicated that it is not possible to avoid personal bias when only one informant gives an examination for his specific organisation. Moreover, relying on the self-report of one informant might result in perceptual and common method biases (Wang, Ying, Jiang & Klein, 2006). In conformity to this assertion, Somers and Nelson (2004) stated that the use of more than one respondent reduces the extent of common method variance bias and facilitates convergent or discriminant validity evaluation. Subsequently, the decision arrived at indicated that multiple respondents from each E-HRM user organisation would maximise the research's validity.

3.4 Sampling Frame and Sampling Method

The sampling frame refers to a list of every element in the target population from which drawing of the sample is done. However, there existed no single source (sampling frame) that could indicate all the E-HRM or ERP (ERP system is an integrated system that includes different types of software to support business functionality such as e-CRM, different financial softwares, E-HRM, and so forth) user organisations in Bangladesh. In essence, no register existed in any public or private institution in Bangladesh regarding the organisations having implemented or are in the E-HRM implementation process. Consequently, the target population of E-HRM user organisations in Bangladesh was unknown. The same problem goes for the identity of national or international E-HRM vendors in Bangladesh's market. These vendors are important to determine their potential E-HRM customers in Bangladesh. Therefore, various ensuing sources were utilised in making a complete list of E-HRM user organisations following guidelines of past research (Dezdar, 2011). The procedure was as follows:

- Searching the 'World Wide Web' using the general keywords of Bangladesh, ERP, E-HRM usage, E-HRM implementation, and so on.
- Investigating the 'websites of the top 25 international E-HRM/ERP vendor companies' to determine their potential customers and their likely local representatives in Bangladesh.
- Exploring the 'websites of the top 30 local IS vendor companies' to determine whether they are representatives of foreign E-HRM vendors, if they provide any E-HRM solutions and finally their possible E-HRM customers in Bangladesh.
- Reviewing the 'websites of governmental organisations in charge of IT' like the Ministry of Posts, Telecommunications & Information Technology, the Ministry of Planning, the Ministry of Science and Technology, the Ministry of Information,

the Ministry of Public Administration to identify possible E-HRM implementation projects in governmental organisations and companies.

- Searching among annual reports of public listed companies circulated by the Dhaka Stock Exchange (DSE) as well as the Chittagong Stock Exchange (CSE) websites, in making a discovery of the probable E-HRM implementation projects.
- Via the telephone, around 300 medium, large and multinational organisations in Bangladesh were asked on E-HRM usage in their organisations.

Based on the previously mentioned steps, a determination of the primary list of 188 E-HRM user organisations was done. Contacting all the 188 companies was done by telephone through their CEOs and/or head of human resource division were interrogated on the E-HRM system and their projects' status. Replies form twenty five companies indicated that their projects were either in the beginning or in the middle of implementing the E-HRM/ERP. Rest of companies did not show their interest in survey participation. Finally, 138 organisations specified that they were in the go-live phase and agreed to take part into the survey. The selected organisations were inclusive of the enterprises in a broad range industries like Manufacturing sector (Agricultural products, Basic Iron and Steel, Consumer Products, Cement, Ceramics, Construction equipment, Electronics, Food & Beverages, Glass Products, Garments, Home Appliances, Petroleum, Pharmaceuticals, Telecommunication Equipment) and the Service sector (Bank, Engineering and Construction, Hospital, Telecommunications and Universities).

3.5 Conceptual Framework

The main concern of this study was to explore the influential factors for E-HRM usage, and to examine its relationship with organisational performance. Within the context of this study, the mediating effect of job satisfaction of HR personnel on the

association of E-HRM application and organisational performance was investigated. In addition, the moderating effect of business experience with E-HRM usage on the association of E-HRM usage and organisational performance was also examined. In this study, the variables were classified into five categories

i. Independent Variable

Behaving as a predictor (either positive or negative), independent variables permitted the manipulation of values of the dependent variable (Collis & Hussey, 2013). A unit of independent variable's increase could result in the dependent variable's increase or decrease (Sekaran & Bougie, 2010). In the current study, there are eleven independent variables i.e., senior executives' characteristics, top management support, perceived compatibility, IT expertise of HR personnel, relative advantage, perceived complexity, perceived cost, organisational culture, competitive pressure and centralisation as well as technology vendor support.

ii. Intervening Variable

For the current study, E-HRM usage represents both independent and dependent variables. Besides, it satisfied the intervening variable's function as defined by Robson (2002), thereupon it might be influenced by independent variables, hence influencing the original dependent variable, organisational performance.

iii. Dependent Variable

Based on Collis and Hussey (2013), the dependent variable values were predicted by independent variable(s). In the current study organisational performance was dependent variable and the variable of primary interest. All independent variables were examined to predict organisational performance.

iv. Moderating Variable

Moderating variable acted to influence 'independent variable – dependent variable' relationship. Functioning as the third variable, it modifies the original 'independent variable – dependent variable' relationship (Cooper & Schindler, 2003; Sekaran & Bougie, 2010). In looking at whether E-HRM usage predicted value creation, the length of time using E-HRM (or known as business experience with E-HRM) was identified as moderating variable. It was believed that business experience with E-HRM had significant contingent effect on E-HRM usage (independent variable) – organisational performance (dependent variable) relationship.

v. Mediating Variable

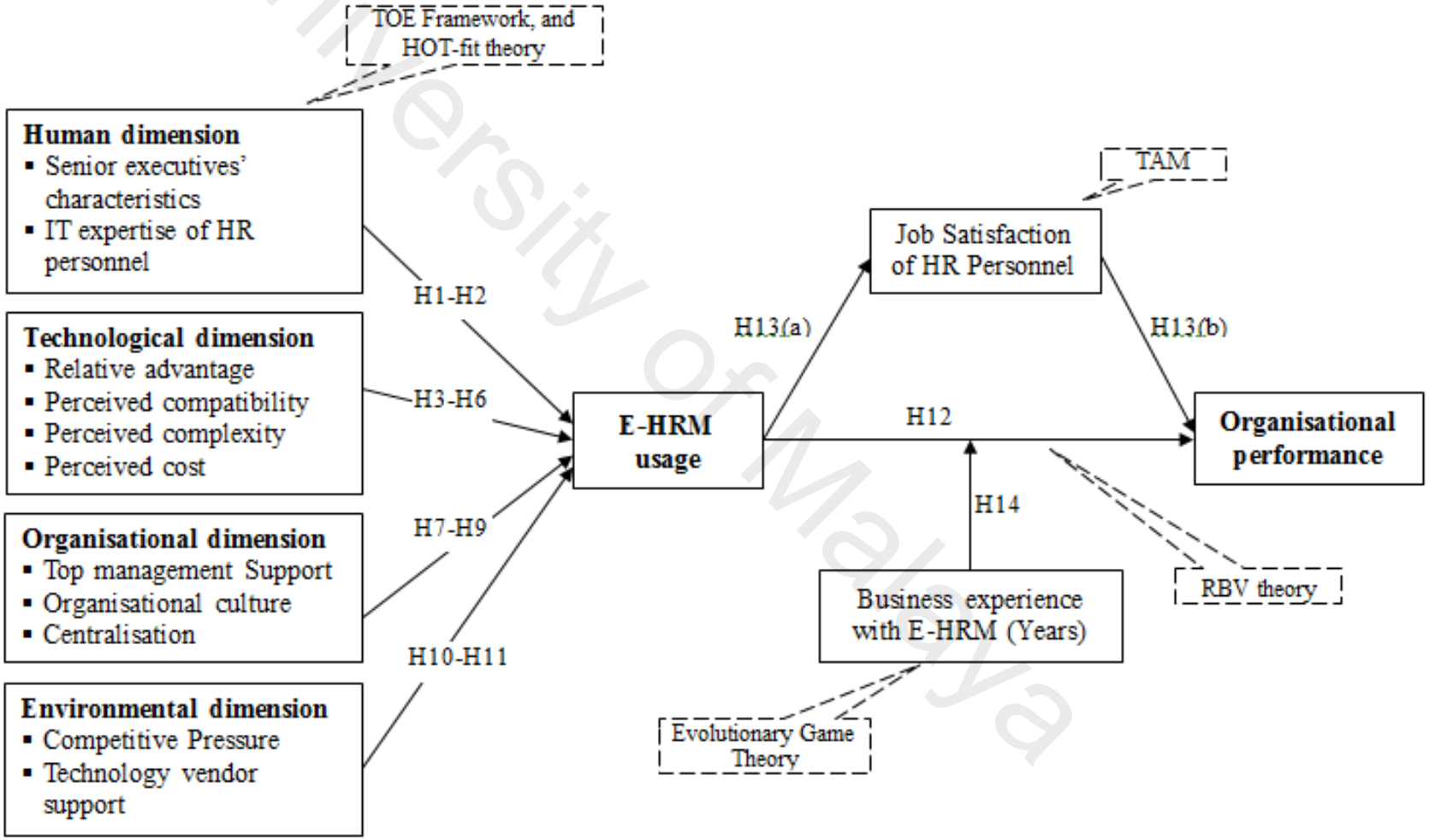
According to Baron & Kenny (1986), mediating variable is one that affects the strength of an association amidst two other variables, and it is one explaining the relationship between the two other variables. In this study, job satisfaction of HR personnel is a mediating variable. It was assumed that job satisfaction of HR personnel had significant influence on the strength of a relationship between on E-HRM usage (independent variable) and organisational performance (dependent variable).

An E-VALUE model (Figure. 3.1) is proposed to give a representation of the hypothesised interrelationship of the selected variables. Since not all needs could be satisfied by a single model, the E-VALUE model became an option for researchers and industry practitioners in evaluating the investment in E-HRM on the perception of the respondents. The types of variable such as independent variables, dependent variable, mediating variable and moderating variable are selected based on the underpinning theories. The E-VALUE model was proposed integrating TOE framework, HOT-fit theory, TAM, evolutionary game theory and RBV theory.

In the previous studies, researchers incorporated the potential adoption or usage factors that influence adoption decision, under three dimensions (i.e., technology, organisation, and environment) of TOE framework. In the current study, one extra dimension (human dimension) was proposed based on HOT-fit theory for better understanding on the factors that determined E-HRM usage. So, eleven independent variables were identified under four types of organisation's context. These independent variables were expected to be the predictor of E-HRM usage at the organisational level.

When contrasting with the theories under study, the eleven independent variables are grouped under TOE Framework, and HOT-fit theory. On the other hand, E-HRM usage and organisational performance are categorised under RBV theory. Job satisfaction of HR personnel for E-HRM usage is grouped under technology acceptance model (TAM). Finally, business experience with E-HRM is grouped under evolutionary game theory.

Figure 3.1: Conceptual Model of the Study



3.6 Measurement of Variables

In this empirical study, hypothesis testing was performed by operating and measuring the study variables (Cooper & Schindler, 2003). This study includes multiple items regarding all variables and multiple informants from a company for appropriateness of subjective performance measures. The research variables of this study encompassed eleven independent variables (i.e., senior executives' characteristics, IT expertise of HR personnel, top management support, perceived cost, relative advantage, perceived complexity, perceived compatibility, organisational culture, competitive pressure, and centralisation as well as technology vendor support). Also, E-HRM usage was considered as intervening variable, job satisfaction of HR personnel was considered as mediating variable, business Experience with E-HRM was considered as moderating variable, and finally organisational performance was treated as the dependent variable. For developing measurement items, this study adopted well-defined and validated scale obtained from the previous studies within the existing literature. Also, all the variables were measured on a seven-point Likert-type scale. The next section would specifically elucidate the measurements of the research's variables.

3.6.1 Senior Executives' Characteristics - Independent Variable

Senior executives have a significant role in the determination of the firms' innovative attitude (Ahmadi et al., 2015). They can take strategic role and have authority to control the organisational attitude toward new technology adoption. These executives are often owners and vital policymakers of the organisations (Alshamaila et al., 2013). Overall, an organisation's change is dependent on both its market factors and size as well as senior executives' ability, their preferences, as well as their readiness to change (Hung, Hung, Tsai & Jiang, 2010). In this study, senior executives are the Managing Director, Deputy Managing Director, Executive Director, Chief Information Officer, Chief Executive Officer, Chief Financial Officer, and Head of human resource department, as

well as others in similar positions of the organisations. Senior executives' characteristics consist of two sub-issues: the senior executives' IT skill and the senior executives' innovativeness (Jeon et al., 2006).

In this study, senior executives' characteristic was measured on basis of prior studies of technology innovations where this variable was noted as a significant factor for adopting new technology (Al-Qirim, 2008; Alshamaila et al., 2013; Ghobakhloo et al., 2011; Hung et al., 2010; Jeon et al., 2006; Rahayu & Day, 2015). In the present study, the influence of senior executives' characteristic on E-HRM usage was measured by their original ideas i.e. innovativeness for accomplishing task (Ghobakhloo et al., 2011; Sophonthummapharn, 2009; Thong & Yap, 1995), their curiosity for implementing new technology for strengthen existng business process (Ghobakhloo et al., 2011; Hung et al., 2010; Lian et al., 2014; Sophonthummapharn, 2009), their risk taking attitude for implementing new technology (Chong & Chan, 2012; Ghobakhloo et al., 2011; Hung et al., 2010; Thong & Yap, 1995), their level of knowledge for using IT applications (Ghobakhloo et al., 2011; Sophonthummapharn, 2009; Thong & Yap, 1995), and their fresh perspectives on old problems (Ghobakhloo et al., 2011; Sophonthummapharn, 2009).

The current research adopted the definition of senior executives' characteristics (IT knowledge and innovativeness) from Agarwal and Prasad (1998), as willingness to introduce new IT application for business processes at developing new products as well as new services. Here, these two sub-issues were highlighted to measure the influence of senior executive's role for adopting new technology. For measuring the 'senior executives' characteristics' construct, this study adopts the instrument used by Sophonthummapharn (2009) which was originally an adapted version of Thong and Yap (1995). In this study, respondents were asked 5 items in the seven-point Likert-type

scale. Table 3.1 provides the items utilised in the operationalisation of the construct that were also used by some pertinent prior research.

Table 3.1: Items Used for Measuring Senior Executives' Characteristics

Item code	Description of indicators	Adopted from past studies
SE1	Senior executives have original ideas.	Thong and Yap (1995); Sophonthummapharn (2009); Hung et al. (2010); Ghobakhloo et al. (2011)
SE2	They would sooner make something new than advance something existing.	Thong and Yap (1995); Sophonthummapharn (2009); Hung et al. (2010); Ghobakhloo et al. (2011); Lian et al. (2014)
SE3	They often risk doing things differently.	Thong and Yap (1995); Sophonthummapharn (2009); Ghobakhloo et al. (2011); Chong and Chan (2012); Hung et al. (2010)
SE4	They do not have good understanding of computer and information systems.	Thong and Yap (1995); Sophonthummapharn (2009); Ghobakhloo et al. (2011);
SE5	They usually have fresh perspectives on old problems.	Sophonthummapharn (2009); Ghobakhloo et al. (2011);

3.6.2 IT Expertise of HR Personnel - Independent Variable

IT expertise refers to personnel's computer knowledge and technical competence that are related to any technological innovation such as E-HRM (Teo et al., 2007). For effective E-HRM operations, HR personnel need to be multidisciplinary with a working knowledge of IS and HR functions (Elliott & Tevavichulada, 1999). Hence, skilled E-HRM professionals' availability is a vital component in the IS based HRM's success in the long-term and continuing growth in a firm. The recent research stated that employees who have both managerial and technical skills are considered as strength for an organisation, and this strength indicates technology readiness for any technology adoption (Jaafar et al., 2007).

Moreover, a significant amount of research examined IT expertise of staffs to explore its impact on IT innovation adoption. They measured computer skill of HR personnel to support human resources functions (Al-Somali, Gholami & Clegg, 2015; Thong & Yap, 1995), computer expertise of HR personnel (Al-Dmour, 2014; Teo et al., 2007), number of computer expert in the HR department (Al-Dmour, 2014; Hung et al., 2010), level of understanding of IS applications in compare to other organisations in the industry (Hung et al., 2010; Teo et al., 2007).

In the context of E-HRM system use, this research adopted the definition of IT expertise of HR staff from Teo et al. (2007), as employees' knowledge of and technical competence in information systems. For measuring the construct- IT expertise of HR personnel, this study adopts the instrument used by Al-Dmour (2014) and Teo et al. (2007). In this study, respondents were asked 4 items in the seven-point Likert-type scale. Table 3.2 provides the items utilised in the operationalisation of the construct that were also used by some pertinent prior research.

Table 3.2: Items Used for Measuring IT Expertise of HR Personnel

Item code	Description of indicators	Adopted from past studies
EC1	HR personnel do not have computer skills	Teo et al. (2007); Hung et al. (2010); Al-Dmour (2014); Lian et al. (2014)
EC2	A specific person (or group) is available for assistance on E-HRM.	Thong (1999); Teo et al. (2007); Hung et al. (2010); Al-Dmour (2014);
EC3	HR personnel's understanding of computer is very good compared to personnel of other organisations in same the industry.	Thong (1999); Teo et al. (2007); Hung et al. (2010); Al-Dmour (2014)
EC4	Our employees possess ability using computer to solve HR related issues.	Rowe, Truex & Huynh (2012); Al-Dmour (2014)

3.6.3 Relative Advantage - Independent Variable

The relative advantage or perceived benefit is the belief specific advantages regarding economic profitability, improved accuracy, performance improvement, and the provision information in a timely and quick manner as well as saving of costs (Grandon & Pearson, 2004; Hung et al., 2010). Numerous researchers investigated the impact of the variable – relative advantage – on the technology innovation adoption. They argued that the relative advantage is a significant predictor between adopter and non-adopter of technology innovations (Chong & Chan, 2012; Teo et al., 2009). To identify the influence of relative advantage on technology innovation adoption, researchers revealed some benefits of the newly adopted or that will be adopted by the organisations. Such as, its role to improve employees' work quality (Teo et al., 2007; Al-Dmour, 2014), its ability to complete tasks more quickly (Moore & Benbasat, 1991; Gangwar et al., 2015), its assistance to improve employees' effectiveness on the job (Al-Dmour, 2014; Lian et al., 2014), its role to make easier HR tasks for HR personnel (Premkumar & Roberts, 1999; Teo et al., 2007), its costs reduction feature in business operations (Chong & Chan, 2012; Hung et al., 2010), its timely information providing capability for decision making, (Lian et al., 2014; Ghobakhloo et al., 2011), and its contribution to increase profitability of the organisation (Lian et al., 2014; Sophonthummapharn, 2009).

In the context of E-HRM system adoption, this research adopted the definition of relative advantage of IT from Clemons and Row (1991), as the degree of perceived benefits is expressed with regard to time-saving, cost reduction, performance improvement and profitability. For measuring the construct - relative advantage, this study adopts the instrument used by Teo et al. (2007) which was originally adapted from prior research of Moore and Benbasat (1991). In this study, respondents were asked 7 items in the seven-point Likert-type scale. Table 3.3 presents the items

employed in the operationalisation of the construct that were also used in similar earlier research.

Table 3.3: Items Used for Measuring Relative Advantage

Item code	Description of indicators	Adopted from past studies
RA1	E-HRM improves the quality of HR personnel's work.	Moore and Benbasat (1991); Teo et al. (2007); Al-Dmour (2014)
RA2	It boosts our effectiveness on the job.	Moore and Benbasat (1991); Teo et al. (2007); Al-Dmour (2014); Lian et al. (2014); Gangwar et al. (2015)
RA3	It does not enable HR personnel to finish tasks quickly.	Moore and Benbasat (1991); Teo et al. (2007); Ghobakhloo et al. (2011); Al-Dmour (2014); Gangwar et al. (2015)
RA4	It does not allow us to cut costs in our operations.	Premkumar and Roberts (1999); Teo et al. (2007); Teo et al. (2009); Hung et al. (2010); Chong and Chan (2012); Lian et al. (2014)
RA5	It provides timely information for decision making.	Premkumar and Roberts (1999); Teo et al. (2007); Hung et al. (2010); Ghobakhloo et al. (2011); Chong and Chan (2012); Lian et al. (2014)
RA6	It creates difficulties for HR personnel to do their work.	Premkumar and Roberts (1999); Teo et al. (2007); Al-Dmour (2014)
RA7	It increases profitability of our organisation.	Premkumar and Roberts (1999); Teo et al. (2007); Sophonthummapharn (2009); Hung et al. (2010); Ghobakhloo et al. (2011); Al-Dmour (2014); Lian et al. (2014)

3.6.4 Perceived Compatibility - Independent Variable

The adoption of new IS has the potential of bringing substantial changes to the traditional workplace practices in the organisations (Premkumar & Roberts, 1999). Consequently, it is essential that the changes be compatible with existing values, beliefs, and technology infrastructure of respective companies. Similarly, E-HRM may change many of HR administrative tasks, organisational culture and belief; even it may change the organisational structure (Al-Dmour, 2014).

Accordingly, most of scholars examined the perceived compatibility to confirm its influence on technology adoption. Previous studies measured the variable as the new system is or would be harmonious with current work practices of the organisations (Ghobakhloo et al., 2011; Premkumar & Ramamurthy, 1995), the new system is or would be compatible with the organisation's values and believes (Lian et al., 2014; Oliveira et al., 2014), the new system is or would be compatible with IT infrastructure such as software, hardware and network facilities (Chong & Chan, 2012; Teo et al., 2007), the new system would be fit with the organisation's work style (Moore & Benbasat, 1991; Ramdani et al., 2013), it would be easy to integrate with existing information systems (Chong & Chan, 2012; Gutierrez et al., 2015).

This study adopted the perceived compatibility of E-HRM definition from Moore and Benbasat (1991). According the Moore and Benbasat (1991), perceived compatibility is the degree to which an innovation is perceived to be consistent with the existing infrastructure, value, and previous experiences as well as the need of potential users or adopters. For measuring the construct- perceived compatibility, this study adopts the instrument used by Oliveira et al. (2014), the items were originally adapted from prior research of Moore and Benbasat (1991) and Chong and Chan (2012). In the present study, respondents were asked 5 items in the seven-point Likert-type scale. Table 3.4 provides the items utilised in the operationalisation of the construct that were also used in preceding research.

Table 3.4: Items Used for Measuring Perceived Compatibility

Item code	Description of indicators	Adopted from past studies
CO1	Adoption of E-HRM modules is compatible with existing HR practices.	Moore and Benbasat (1991); Teo et al. (2007); Sophonthummapharn (2009); Ramdani et al. (2013); Oliveira et al. (2014); Lian et al. (2014)
CO2	Adoption of E-HRM modules is consistent with our organisation's values and beliefs.	Moore and Benbasat (1991); Teo et al. (2007); Ghobakhloo et al. (2011); Lian et al. (2014); Oliveira et al. (2014); Gutierrez et al. (2015)
CO3	Adoption of E-HRM modules is compatible with current IT infrastructure (software, hardware and network facilities).	Chong and Chan (2012); Lian et al. (2014); Oliveira et al. (2014); Al-Somali et al. (2015); Gangwar et al. (2015)
CO4	Using an E-HRM application fits with the organisation's work style.	Moore and Benbasat (1991); Sophonthummapharn (2009); Ramdani et al. (2013); Oliveira et al. (2014)
CO5	It is easy to integrate E-HRM modules with our existing systems (e.g. CRM, SCM).	Chong and Chan (2012); Lian et al. (2014); Ghobakhloo et al. (2011); Gutierrez et al. (2015)

3.6.5 Perceived Complexity - Independent Variable

The complexity of a new IS initiates uncertainty for effective implementation. Hence, the easier it is to integrate the new system into business work practices, the greater the chance of its adoption (Premkumar & Roberts, 1999). There is a bunch of research done in IT innovation adoption, where perceived complexity was measured to identify its effect on a new IS adoption. Researchers claimed that if an employee perceived IS applications as complex tools, the project may lead to be unsuccessful (Chong & Chan, 2012; Hung et al., 2010). The IS implementation group of the potential organisations should develop a proper plan for adopting a new system, thus the development process becomes interesting and enthusiastic for the organisations (Chang et al., 2007; Oliveira et al., 2014). Some researchers proclaimed that user friendly IS increases the intention of usage among employees (Gangwar et al., 2015; Teo et al.,

2007). In addition, Premkumar and Roberts (1999), and Al-Dmour (2014) revealed that organisations should be aware of new IS for integrating existing work practices.

This study adopted the definition of perceived complexity from Thompson, Higgins and Howell (1991), as the degree to which a system is perceived as comparatively challenging in understanding and using. For measuring the construct - perceived complexity, this study adopts the instrument used by Teo et al. (2007) which was originally adapted from prior research of Moore and Benbasat (1991). In this study, respondents were asked 4 items in the seven-point Likert-type scale. Table 3.5 presents the items used in the operationalisation of the construct that were employed in associated research.

Table 3.5: Items Used for Measuring Perceived Complexity

Item code	Description of indicators	Adopted from past studies
CX1	E-HRM modules are too complex for our employees.	Premkumar and Roberts (1999); Chang et al. (2007); Teo et al. (2007); Sophonthummapharn (2009); Chong and Chan (2012); Al-Dmour (2014)
CX2	The development of E-HRM modules is a complex process.	Teo et al. (2007); Chong and Chan (2012); Al-Dmour (2014); Oliveira et al. (2014); Lian et al. (2014)
CX3	Learning E-HRM technology operations is not easy for us.	Moore and Benbasat (1991); Sophonthummapharn (2009); Teo et al. (2007); Al-Dmour (2014); Gangwar et al. (2015)
CX4	Integrating E-HRM modules into our current work practices is difficult.	Premkumar and Roberts (1999); Chang et al. (2007); Teo et al. (2007); Al-Dmour (2014); Lian et al. (2014); Gutierrez et al. (2015)

3.6.6 **Perceived Costs -** Independent Variable

The cost for IS adoption is comprises of setup costs, operating costs and training costs as well as maintaining costs associated with IS applications (Teo et al., 2009). Typically, the cost is the prime facilitator or inhibitor of technology innovation. The less cost characteristic of certain technology indicates the likelihood of quick adoption of that technology in organisations (Tornatzky & Klein, 1982). There was a bunch of research done to find out the relations between perceived costs and technology innovations. They attested that the higher implementation cost hinders adoption of any new technology in organisations (Agarwal & Prasad, 1998; Lin, 2014; Teo et al., 2009), lack of training and its related cost are inhibitor of technology adoption (Al-Somali et al., 2015; Lian et al., 2014), maintenance as well as technical support is need after adopting a technology for its continuity (Lin, 2014; Teo et al., 2009), and an organisation does not accept new technologies, if they perceived or experienced that costs related to these technologies are far greater than the benefits (Oliveira et al., 2014; Premkumar & Roberts, 1999).

This study adopted the definition of perceived costs from Al-Somali et al. (2015), as the estimated costs for adopting a new technology inclusive of the initial development investments and recurring operating expenses (direct and indirect cost of adoption). For measuring the construct - perceived costs, this study adopts the instrument used by Lian et al. (2014) and Oliveira et al. (2014) that was originally adapted from prior research Agarwal and Prasad (1998) and Premkumar and Roberts (1999). In this present study, organisations were asked 4 items in the seven-point Likert-type scale. Table 3.6 gives a presentation of the items utilised in the operationalisation of the construct which were also used in the pertinent studies.

Table 3.6: Items Used for Measuring Perceived Costs

Item code	Description of indicators	Adopted from past studies
PC1	The implementation cost of E-HRM is high for our organisation.	Agarwal and Prasad (1998); Teo et al. (2009); Ghobakhloo et al. (2011); Lin (2014); Lian et al. (2014); Al-Somali et al. (2015)
PC2	The time of training for E-HRM is not high for our organisation.	Agarwal and Prasad (1998); Premkumar and Roberts (1999); Teo et al. (2009); Ghobakhloo et al. (2011); Lin (2014); Lian et al. (2014); Al-Somali et al. (2015)
PC3	The maintenance and support fees for E-HRM modules are high for our company.	Agarwal and Prasad (1998); Premkumar and Roberts (1999); Teo et al. (2009); Lin (2014); Lian et al. (2014); Oliveira et al. (2014); Al-Somali et al. (2015)
PC4	The adoption costs of E-HRM technology are far greater than its benefits.	Premkumar and Roberts (1999); Oliveira et al. (2014)

3.6.7 Top Management Support - Independent Variable

Top management support implies the organisation's senior executives' willingness to ensure the essential assets and power or authority for success of any technology innovation (Sila, 2013). The more the support from senior executives, the easier it will be for adopting a new technology in organisations. Such support helps to overcome difficulties encountered during adoption. In the contemporary studies, researchers emphasised the variable for adopting new technologies.

Several researchers pointed out that active support of top management accelerate the adoption (Lin, 2014; Premkumar & Roberts, 1999; Teo et al., 2007). Moreover, providing adequate resources (e.g., human, money, and other facilities) is the important contribution of senior executives to success the adoption project (Chang et al., 2007; Gutierrez et al., 2015). Past research also indicate that senior executives should be aware enough of benefits of new system, thus they can help according to its importance (Ghobakhloo et al., 2011). Beside, Al-Dmour (2014) stated that people have a tendency

to stay at a distance from a new system, if they perceive the new system as something complex or unfavorable. HR professionals have also a leaning to fear whether they will have critics for not already doing a good enough jobs or the new E-HRM will be result in their replacement. So, top management should encourage and positively motivate employees to use the new system in their daily tasks (Premkumar & Roberts, 1999; Teo et al., 2007). Moreover, researchers argued that top management's active participation in establishing and formulating strategies for a new system affects the success of the system (Lin, 2014; Gangwar et al., 2015). Table 3.7 represents all the items.

Table 3.7: Items Used for Measuring Top Management Support

Item code	Description of indicators	Adopted from past studies
TM1	Top management enthusiastically supports the adoption of E-HRM.	Premkumar & Roberts (1999); Teo et al. (2007); Chong & Chan (2012); Al-Dmour (2014); Lin (2014); Lian et al. (2014); Oliveira et al. (2014); Gutierrez et al. (2015)
TM2	Top management has allocated adequate resources for the adoption of E-HRM.	Premkumar & Roberts (1999); Teo et al. (2007); Al-Dmour (2014); Lin (2014); Lian et al. (2014); Gutierrez et al. (2015)
TM3	Top management is aware of the benefits of E-HRM.	Premkumar & Roberts (1999); Teo et al. (2007); Al-Dmour (2014); Lin (2014); Lian et al. (2014); Gutierrez et al. (2015)
TM4	Top management actively encourages human resource personnel to use E-HRM in their daily tasks.	Premkumar & Roberts (1999); Teo et al. (2007); Al-Dmour (2014); Lian et al. (2014); Gutierrez et al. (2015)
TM5	Top management actively participates in establishing a vision and formulating strategies for utilizing E-HRM	Chong and Chan (2012); Al-Dmour (2014); Oliveira et al. (2014); Lin (2014); Gangwar et al. (2015)

The present research adopted the definition of top management support based on Teo et al. (2007). According to Teo et al. (2007), top management support is the availability of a helpful environment with adequate resources availed by the firm's top management for the adoption/usage of a new IS applications in the firm. For measuring the construct

- top management support, this study adopts the instrument used by Al-Dmour (2014) which was originally adapted from prior research of Premkumar and Roberts (1999). In this study, respondents were asked 5 items in the seven-point Likert-type scale. Table 3.7 presents 5 items employed in the operationalisation of the construct that were also adopted in associated studies.

3.6.8 Organisational Culture - Independent Variable

Generally speaking, culture is concerned with philosophies of shared beliefs, values, assumptions, and significant meanings (Krumbholz & Maiden, 2001). This study attempts to capture the essential value structure which generates meaning in organisational settings. In a contemporary study, culture is operationalised as shared values interacting with a firm's structures and control systems in the generation of behavioural norms (Nah, Islam & Tan, 2008). Preceding researchers have developed various concepts, frameworks, and dimensions in the study of culture and ants its impact on technology adoption or intention to use technology. To investigate the influence of organisational culture on IS innovation adoption, most of the prior IS research have employed items such as management freely shares information (Hofstede & Hofstede, 2001; Ifinedo, 2007), employees are encouraged to share their knowledge and experience (Al-Dmour, 2014; Nah et al., 2008; Teo et al., 2009), employees' willingness to share information among the different departments of the organisation (Nah et al., 2008; Teo et al., 2009), supportive and helpful atmosphere (Al-Dmour, 2014; Ifinedo, 2007; Nah et al., 2008).

This study adopted the organisational culture from Hofstede and Hofstede (2001), defining organisational culture as a set of collective experiences, beliefs and values as well as the behavioural norms in an organisation which facilitates the implementation process of the E-HRM system. For measuring the construct - organisational culture, this

study adopts the instrument used by Hofstede and Hofstede (2001) and Martins and Terblanche (2003). In this study, respondents were asked 5 items in the seven-point Likert-type scale. Table 3.8 provides the items used in the operationalisation of the construct which were customised from preceding pertinent studies.

Table 3.8: Items Used for Measuring Organisational Culture

Item code	Description of indicators	Adopted from past studies
OC1	The history, value, norms of our organisation supports adoption/usage of E-HRM technology.	Martins and Terblanche (2003); Al-Dmour (2014)
OC2	In our company, we believe that E-HRM technology provides efficiency in managerial processes of HR department.	Martins and Terblanche (2003); Al-Dmour (2014)
OC3	Information sharing is encouraged within our organisation.	Hofstede and Hofstede (2001); Ifinedo (2007); Teo et al. (2009); Li et al. (2015)
OC4	Employees are encouraged to share their opinions and ideas regarding work.	Hofstede and Hofstede (2001); Krumbholz and Maiden (2001); Teo et al. (2009); Li et al. (2015)
OC5	In our organisation, there is willingness to collaborate across organisational units.	Krumbholz & Maiden (2001); Teo et al. (2009); Al-Dmour (2014); Li et al. (2015)

3.6.9 Centralisation - Independent Variable

Centralised organisational structures rely on few individuals like the top-level decision makers in making decisions and providing direction for the organisation (Rogers, 1995). Centralisation has the potential of encouraging employees into being more cooperative concerning sharing of discoveries and techniques, and reducing risk as well as duplication of effort. Besides, organisations following a systems-structural management's perspective have the ability to hypothesise that centralisation improves effectiveness since it allows decision maker the ability of planning, coordinating, and controlling (Dembla, Palvia & Krishnan, 2007). Pierce and Delbecq (1977) suggest that

centralisation of decision-making has the potential of reducing conflict amidst the organisational units while fostering innovation adoption. The finding by Etllie et al. (1984) supports this proposition such that firms having a centralised structure had an increased likelihood of adopting new technologies. Preceding studies have given ambiguous results with some showing significant effect of a centralised organisational structure (concentration of decision-making) on the adoption of technology while others have indicated non-significant effect.

For measuring the impact of organisational centralised structure on technology innovation adoption, a wide range of measures were employed by previous researchers such as it is compulsory taking approval for all major strategic decisions (Caruana, Morris & Vella, 1998; Dembla et al., 2007); employee need to ask senior management before doing almost any decision (Al-Dmour, 2014; Caruana et al., 1998; Dembla et al., 2007); even, relatively small matters needs approval from higher position management (Al-Dmour, 2014; Caruana et al., 1998); employees' decision making authority is very limited (Caruana et al., 1998; Dembla et al., 2007).

This research adopted the definition of centralisation for E-HRM usage from the Hage and Aiken (1967). As such, the concentration of decision-making activity increases the predictability of decision's outcomes. For measuring the construct - centralisation, this study adopts the instrument used by Dembla et al. (2007) which was originally adapted from prior research of Caruana et al. (1998). In this study, respondents were asked 4 items in the seven-point Likert-type scale. Table 3.9 offers the items used in the operationalisation of the construct which were adopted from Caruana et al. (1998), Dembla et al. (2007) and Al-Dmour (2014).

Table 3.9: Items Used for Measuring Centralisation

Item code	Description of indicators	Adopted from past studies
CE1	All major strategic decisions need to be approved by top management.	Caruana et al. (1998); Dembla et al. (2007);
CE2	In our organisation, we have to ask senior management before doing almost any decision.	Caruana et al. (1998); Dembla et al. (2007);Al-Dmour (2014)
CE3	In my experience, even quite small matters have to be referred to someone higher up for a final answer.	Caruana et al. (1998); Dembla et al. (2007); Al-Dmour (2014)
CE4	We can take very little action on our own until the senior management approves it.	Caruana et al. (1998); Dembla et al. (2007);Al-Dmour (2014)

3.6.10 Competitive Pressure - Independent Variable

In the current study competitive pressure implies the entire trend, operational practices' direction and the competition extent driving a company towards adopting a technology innovation for survival in the industry as well as maintains its competitive advantages. As firms move to an economy based on knowledge, the pressures keeps on growing for HR to ensure reduction of costs and serving an increasingly strategic role for HRM (McCormick, 1999). A realisation by companies is that it is not possible to be competitive without properly managing their human resources (Teo et al., 2007). As such, firms are utilising E-HRM to assist in making better informed decisions, getting maximum results from people assets and streamlining HR processes as well as better allocation of human resources (Al-Mobaideen et al., 2013). Therefore, the urge of being competitive in the entire spectrum of business will result in the adoption and usage of E-HRM.

For measuring the influence of competitive pressure on technology innovation adoption, a wide range of measures were adopted by earlier researchers. Such as, preceding scholars believed that IS adoption is a strategic tool for achieving competitive advantages (Sophonthummapharn, 2009; Teo et al., 2007). Besides, an organisation feel

competitive pressure when its competitors already have adopted IS applications (Chong & Chan, 2012; Grandon & Pearson, 2004). Furthermore, the comprehensive operational practices in the industry may force an organisation to adopt IS applications (Premkumar & Ramamurthy, 1995). Lastly, organisations should keep track of competitors' innovative activities to compete them (Al-Dmour, 2014; Al-Somali et al., 2015).

This study adopted the competitive pressure definition from Sophonthummapharn (2009), as the overall trend, operational practices' competition and direction forcing an organisation towards embracing E-HRM for survival in the industry or enduring its competitive advantages. For measuring the 'Competitive Pressure' construct, this study adopts the instrument used by Teo et al. (2007) and Sophonthummapharn (2009). In this study, Table 3.10 provides 4 items utilised in the construct's operationalization, and respondents were asked these the items in the seven-point Likert-type scale.

Table 3.10: Items Used for Measuring Competitive Pressure

Item code	Description of indicators	Adopted from past studies
CP1	Competition is a factor in organisation's decision to adopt E-HRM technology.	Grandon and Pearson (2004); Sophonthummapharn (2009); Al-Dmour (2014); Al-Somali et al. (2015)
CP2	The overall HRM practices pressure us to adopt E-HRM technology.	Teo et al. (2007); Sophonthummapharn (2009); Al-Dmour (2014); Lian et al. (2014); Al-Somali et al. (2015)
CP3	Our competitors are pressuring us to use E-HRM modules.	Grandon and Pearson (2004); Teo et al. (2007); Sophonthummapharn (2009); Ghobakhloo et al. (2011); Chong and Chan (2012); Al-Dmour (2014)
CP4	It is a strategic necessity to use E-HRM technology in the workplace.	Premkumar and Ramamurthy (1995); Sophonthummapharn (2009); Ghobakhloo et al. (2011)
CP5	Our company keenly keeps track of new information system used by our competitors.	Teo et al. (2007); Al-Dmour (2014); Al-Somali et al. (2015)

3.6.11 Technology Vendor Support - Independent Variable

Earlier researchers revealed that if CEOs of organisations perceive that technology vendors of IS applications provide the required supports for the adoption of IS, then there would be a possibility of being more willing towards adopting and intensely using these technologies (Ghobakhloo et al., 2011). To increase the intention of new IS implementation among organisations, prior studies pinpointed the necessary features of technology vendor support and services. Such as, applying strategic marketing policy could attract the potential IS adopters (Ghobakhloo et al., 2011; Premkumar & Roberts, 1999), providing quality training with adequate time (Gutierrez et al., 2015; Sophonthummapharn, 2009), ensuring adequate technical support during IS implementation (Chang et al., 2007; Gutierrez et al., 2015), and after implementation (Al-Somali et al., 2015; Chang et al., 2007), and finally providing suitable user guides, operation guides, manuals, and any formal documents required for using the new information system (Huang, Chang, Li & Lin, 2004; Wu & Wang, 2007).

In the context of E-HRM usage, the study adopted the definition of technology vendor support based on Sophonthummapharn (2009), as the provision of technical services and support at a suitable time and of a suitable quality and offering the complete training as well as supplementary documents needed in using E-HRM. For measuring the construct - technology vendor support, this study adopts the instrument used by Al-Dmour (2014) and Gutierrez et al. (2015) which was originally adapted from prior research of Chang et al. (2007). In this study, Table 3.11 provides 5 items employed in the construct's operationalisation and respondents were asked these the items in the seven-point Likert-type scale.

Table 3.11: Items Used for Measuring Technology Vendor Support

Item code	Description of indicators	Adopted from past studies
VS1	Availability of solutions for information system related problems motivate us to adopt E-HRM modules.	Wu and Wang (2007); Al-Dmour (2014)
VS2	Vendors do not provide enough training to increase user's proficiency in E-HRM modules.	Chang et al. (2007); Sophonthummapharn (2009); Ghobakhloo et al. (2011); Al-Dmour (2014); Gutierrez et al. (2015)
VS3	Adoption of E-HRM is influenced by the marketing activities of technology vendors.	Premkumar and Roberts (1999); Sophonthummapharn (2009); Ghobakhloo et al. (2011); Al-Dmour (2014); Gutierrez et al. (2015)
VS4	Technology vendor provides adequate technical support during E-HRM implementation.	Premkumar and Roberts (1999); Chang et al. (2007); Ghobakhloo et al. (2011); Gutierrez et al. (2015)
VS5	Technology vendor does not provide adequate technical support after E-HRM implementation.	Chang et al. (2007); Al-Somali et al. (2015); Gutierrez et al. (2015)

3.6.12 E-HRM usage – Intervening variable

E-HRM usage refers to the execution, accomplishment or realisation of HR related activities like staff's information maintenance, salary operations monitoring, keeping information regarding absences and performing administrative affairs as well as employment and training program, etc. This is through IT applications to help the HR department for administrative functions, planning, and decision making as well as controlling activities of the human resource management.

Review of literature shows that the term E-HRM usage, implementation, adoption, and diffusion were used interchangeably without any difference in the meaning (Bondarouk, Ruel & van der Heijden, 2009; Ruël et al., 2004; Ruël & van der Kaap, 2012). In addition, Al-Dmour (2014) investigated the same factors to explore their influence for HRIS adoption and implementation in the organisational level. Therefore,

for the current study, E-HRM usage was assumed to be equivalent to E-HRM implementation or E-HRM usage. Moreover, the terms (usage, implementation, adoption, and diffusion) were also used interchangeably in similarly IS adoption research such as E-business. For example, in Zhu and Kraemer (2005), the term E-business usage is being used but in another article by Zhu and Kraemer (2003), the word E-business adoption was used in reference to E-business usage. With the same thought, Salwani et al. (2009) used these terms interchangeably. Therefore, as for the current study, the term E-HRM usage is assumed to be equivalent to E-HRM implementation, adoption, or diffusion.

The present research adopted the definition of E-HRM usage relying on Teo et al. (2007), as whether the firm was making use computer hardware and software applications in supporting its HRM activities, for instance planning, staffing, compensation, etc. For measuring the 'E-HRM usage' construct, the items were adopted from previous research on E-HRM applications. In this study, E-HRM usage was measured by looking at respondents' perception regarding E-HRM activity distributions. The measurement of E-HRM activity distribution was based on seven attributes: a) perceived percentage of usage of recruitment and selection module, b) perceived percentage of usage of training and development module, c) perceived percentage of usage of payroll, benefits and compensation management module, d) perceived percentage of usage of performance appraisal module, e) perceived percentage of usage of HR planning module, f) perceived percentage of usage of internal and external communication module, and g) perceived percentage of usage of employee self-service portal. Also, these seven items - E-HRM modules - were selected based on the availability of E-HRM modules i.e., in companies. In this study, respondents were asked 7 items in the seven-point Likert-type scale (Table 3.12).

Table 3.12: Items Used for Measuring E-HRM usage

Item code	Description of indicators	Adopted from past studies
AP1	Recruitment and selection	Teo et al. (2001); Dineen et al. (2002); Pollitt (2004); Kundu and Kadian (2012); Bian (2012); Al-Dmour (2014)
AP2	Training and development	Marquardt (1996); Teo et al. (2001); Long & Smith (2004); Kundu & Kadian (2012); Bian (2012); Al-Dmour (2014)
AP3	Payroll, benefits and Compensation management	Teo et al. (2001); Payton (2003); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
AP4	Performance appraisal	Hansen and Deimler (2001); Teo et al. (2001); Kundu and Kadian (2012); Bian (2012); Al-Dmour (2014)
AP5	HR planning	Walker (1993); Teo et al. (2001); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
AP6	Internal and External communication	Dos Santos & Kuzmits (1997); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)
AP7	Employee self-service portal	O'Connell (1996); Hendrickson (2003); Ngai et al. (2008); Bian (2012); Al-Dmour (2014)

3.6.13 Organisational Performance - Dependent Variables

This study refers organisational performance as the degree to which an organisation is successful in meeting its present goals or stated objectives (Mia & Clarke, 1999). Also, performance replicates the extent to which an organisation is implementing a suitable strategy effectively (Otley, 1999). As there is acute scarcity of research on the E-HRM's impact on organisational performance, in this study, the association of E-HRM applications and organisational performance is examined that is supported by several past and recent studies on IS applications, HRM practice and organisational performance. However, Ruël and van der Kaap (2012) stated that E-HRM research is partly rooted in HRM research, which is concern with sociology and psychology, organisational behaviour and organisation studies, and partly rooted in IS research.

Researchers have explored the influence of IS on organisational performance and employed organisational performance measures as dependent variable in their studies. Researchers applied financial measures (Ainin et al., 2015; Saira et al., 2010) and non-financial measures (Chen & Zhu, 2004) and, in some studies, they applied both measures (Hong et al., 2012; Lunardi et al., 2014) to evaluate the impact of IS on organisation performance. In the same vein, in HRM system research arena, numerous scholars employed organisational performance as dependent variable (De Grip & Sieben, 2009; Katou & Budhwar, 2006; Leffakis & Dwyer, 2014; Lin, 2012; Su & Wright, 2012).

In the HRM practice and performance measurement studies, scholars employed HR efficiency (Dyer & Reeves, 1995; Chen & Zhu, 2004; Katou & Budhwar, 2006), HR work quality (Hong et al., 2012; Katou, 2015; Katou & Budhwar, 2006), customer satisfaction (Katou, 2015; Katou & Budhwar, 2006), internal business process, customer satisfaction (Katou, 2015; Katou & Budhwar, 2006), employee satisfaction (Katou, 2015; Katou & Budhwar, 2006), employee productivity (Lin, 2012), HR development (Katou, 2015; Katou & Budhwar, 2006), innovation (Guest, 2001; Katou, 2015; Katou & Budhwar, 2006; Zhang, 2008).

Based on previous empirical research, this study prefers self-rating and subjective measures for non-financial performance. In this study, the instrument, designed by Katou and Budhwar (2006), was incorporated to conceptualise organisational performance using nonfinancial variables (quality, effectiveness, satisfaction, innovation, efficiency and development) (Table 3.13). In this study, effectiveness indicates the organisational capability towards meeting its objectives through HRM, efficiency shows whether the firm makes use of the fewest possible human resources in meeting its objectives, development is measured by its capacity to meet future

opportunities and challenges through HR, satisfaction indicates the level of employees' satisfaction and customers' satisfaction for HR services, innovation indicated the role of HR for products and processes, quality is measured by HR work quality and products of high quality for HR. It aggregates multiple performance dimensions from non-financial performance measures rather than on any single dimension. Inclusion of both measures in the instrument is aimed at examining the leading indicators that usually are not publicly disclosed. In other words, this multiple indicators approach is supposed to be the most suitable scale due to incorporating all facets either quantitative or qualitative, nonfinancial performance in the evaluation (Mia & Clarke, 1999).

Table 3.13: Items Used for Measuring Organisational Performance

Item code	Description of indicators	Adopted from past studies
OP1	Effectiveness (the way in which an organisation attains its goals/objectives).	Dyer and Reeves (1995); Katou and Budhwar (2006); Katou (2015)
OP2	Efficiency (the extent to which the organisation succeeds in utilising a minimum of resources in order to reach its objectives).	Dyer and Reeves (1995); Rogers & Wright (1998); Katou and Budhwar (2006); Katou (2015)
OP3	Development (the extent to which the organisation develops itself in order to meet future challenges and opportunities).	Phillips (1996); Katou and Budhwar (2006); Katou (2015)
OP4	Satisfaction (measured for all stakeholders except HR employees).	Delaney and Huselid (1996); Katou and Budhwar (2006); Katou (2015)
OP5	Innovation (with regards to products and processes).	Guest (2001); Katou and Budhwar (2006); Katou (2015)
OP6	Quality (the percentage of goods or services that is of high quality).	Delaney and Huselid, (1996); Katou and Budhwar (2006); Katou (2015)

In this study, the informants were asked to assess their organisational performance along the particular factors, employing a seven-point Likert-type scale with responses in

the range of "significantly below average" and "significantly above average". It is imperative to mention that, an aggregate score was computed for the six diverse performance measures (Table 3.13).

3.6.14 Business Experience with E-HRM – Moderating variable

In the adoption of innovation behaviour, adoption of E-HRM depends on managers' individual experience or other organisation's experience coupled with the potential effect of the dynamic technology environment's perception on their organisations (Troshani et al., 2011). Based on the literature review's findings, unavailability of reliable information source to gain knowledge in E-HRM usage as well as insufficient knowledge and experience in communicating information concerning such applications maybe the hindrances for their adoption. Al-Dmour (2014) revealed that an IT experience was one of the significant factors for implementing HRIS in Jordanian firms.

In the same vein, earlier studies stated that the IT experiences factor is shown to have a direct relationship with the level of using E-HRM applications. This might indicate the higher availability of IT experiences and capabilities, the higher the level of implementation of E-HRM will be. This result appears to be in line with Papalexandris and Panayotopoulou (2005). In addition, most businesses in developing countries have very limited experience of doing business electronically and lack of experience hinders any innovation adoption (Molla & Licker, 2005b). Moreover, Salwani et al. (2009) investigated the role of business experience with IT on the relationship of e-Commerce adoption and business performance. They found that business experience with IT moderates the relationship.

In the context of E-HRM adoption, this research adopted the definition of business experience with E-HRM from Al-Dmour (2014), as the length of time that organisations

are engaged in using IS/IT/E-HRM for business activities. For measuring the construct - business experience with E-HRM, this study adopts the instrument used by Salwani et al. (2009) which was used as a moderator between the relationship of e-Commerce adoption and business performance. In this study, respondents were asked 1 item in the seven-point Likert-type scale to conceptualise the construct (Table 3.14).

Table 3.14: Items Used for Measuring Business Experience with E-HRM

Item code	Description of indicators	Adopted from past studies
EXE_EHR	Number of year of experience with E-HRM	Kauffman et al. (2002); Sophonthummapharn (2009); Salwani et al. (2009); Al-Dmour (2014)

3.6.15 Job Satisfaction of HR Personnel – Mediating variable

Hoppock (1935) initially presented job satisfaction also referred to as work satisfaction in his book 'Job satisfaction' as a theoretical construct. He showed that an employee's job satisfaction originates from the mental and physical satisfaction in the work environment and the work itself, i.e., an employee's subjective reaction to the work situation. Job satisfaction reflects the degree to which individuals find their job enjoyable. As such, it is an emotional response to a variety of aspects. Job satisfaction is not a unitary concept since it possible for an individual to be relatively satisfied with one area of his or her job and completely dissatisfied with other areas (Shiu & Yu, 2010).

New systems' implementation and use like an E-HRM permit HR transformation from a hugely administrative function to one of strategic partner. But this change may affect employees' job satisfaction Maier et al. (2013). Also, the transforming from HRM to E-HRM influences the opinions of employees regarding their jobs/work and the organisation (Bondarouk & Ruël, 2009; Elkins & Phillips, 2000). In addition,

research indicated that an E-HRM necessitates the need for employees towards changing work habits and adjusting to a new workflow (Wanberg & Banas, 2000). Learning new routines needed in dealing with the E-HRM leads in the creation of more work and additional stress. Consequently, a person leaves an organisation in the event that stress at work occurs and as such indicating declining job satisfaction.

With the introduction of an E-HRM in an organisation, each employee working with the system makes an evaluation of the new technology, for instance, based on its usefulness and ease of use (Davis et al., 1989). The skills required in operating the new system give a representation of the vital success factor for E-HRM employees (Panayotopoulou et al., 2007). Especially, as many HR employees lack skills and knowledge for using the system (Lukaszewski, Stone & Stone-Romero, 2008). It imposes a restriction on HR employees in the exploitation of the EHRM's full potential. Whenever employees are unaware of all the EHRM's possibilities, they tend to negatively evaluate the system. In the converse, HR employees with the knowledge of performance of the system and thus the manner in which enhances their work and gives them additional time for strategic task, perceive the E-HRM as more useful. In addition, employees generally make a positive evaluation of an E-HRM only when they possess adequate skills and knowledge for using it with relative ease, which is might always not be the case (Lukaszewski et al., 2008). As such, additional effort via training is essential in ensuring that HR employees positively evaluate the E-HRM. In the event that an E-HRM is challenging to use, the employees of HR tend to have a negative attitude on the use of the system (Beckers & Bsat, 2002).

This study adopted the definition of Job Satisfaction of HR Personnel from Bitner, Brown and Meuter (2000) and Chang et al. (2012), as the system user's psychological state incorporates their positive or negative feelings or attitudes ensuing from

experiencing the information system's services. In this study, four questions were adopted to characterise the satisfaction of an employee at work. A seven-point Likert-type scale, with anchor by 1 (strongly disagree) and 7 (strongly agree), is utilised in capturing the evaluation of an employee of the overall job (Table 3.15). The scale is adopted from Maier et al. (2013) who used this construct as a mediating variable to investigate its mediating effect on the relationship of HR personnel employee E-HRM using attitude and turnover intention.

Table 3.15: Items Used for Measuring Job Satisfaction of HR Personnel

Item code	Description of indicators	Adopted from past studies
JS1	I am satisfied with the way I work at the moment.	Maier et al. (2013)
JS2	I am satisfied with the important aspects of my job.	
JS3	I am satisfied with E-HRM modules for performing my HR activities.	
JS4	Overall, I am satisfied with usage of E-HRM modules.	

3.7 Hypotheses Development

Hypotheses was referred to "an idea or proposition which can be tested for associated or causality by deducing logical consequences which could be tested against empirical evidence" (Collis & Hussey, 2013). Discussions on theoretical perspectives led the researcher to believe that E-HRM usage was predicted by multiple factors that acted as factors to the level of E-HRM usage, and might influence organisational performance. Based on the research framework and prior discussions, the research hypotheses are presented in the following paragraphs.

3.7.1 Relationship between Senior Executives' Characteristics and E-HRM usage

Earlier scholars have verified a positive correlation between the CEO's characteristics and technological innovations including E-HRM usage in the organisations (Al-Qirim, 2008; Alshamaila et al., 2013; Ghobakhloo et al., 2011; Hung et al., 2010; Jeon et al., 2006; Rahayu & Day, 2015; Seif, 2015; Sophonthummapharn, 2009).

Based on previous findings, the CEOs (senior executives/owners) assume the managerial responsibility and technological innovations use in organisations (Jeon et al., 2006). An organisation's strategic decision towards adopting or rejecting an innovation usually shows its top managers' personal characteristics (Lian et al., 2014). The CEO's IT knowledge and new innovation perception plays a significant role in IT adoption. A CEO's innovativeness and positive attitude towards new technology influences the IT adoption applications in a positive way (Hung et al., 2010). Besides, an ensuing argument is that greater intention to adopt solutions from IT is directly attributable to the more positive business owners' attitude in the adoption of IT. In essence, when the CEO perceives that IT adoption has higher merits incompare to its risks, then the business has a high likelihood of adopting IT. Thus, this discussion leads to the following hypothesis:

H1: Senior executives' characteristics has influence on E-HRM usage.

3.7.2 Relationship between IT Expertise of HR Personnel and E-HRM usage

IT expertise is an important factor in the E-HRM innovation adoption. A growing body of literature has identified HR knowledge on IS as an essential factor of technology readiness for any technological innovation. For example, Panayotopoulou et al. (2007) claimed that firms whose staff have the necessary skills and technical

knowledge are more likely to develop E-HRM applications. With that same train of thought, Teo et al. (2007) postulate that the expertise with E-HRM fosters the implementation of E-HRM. Supporting the earlier research, Bian (2012) indicated IT expertise is a strong predictor to the decision to adopt E-HRM in China's firms.

Earlier scholars have verified a positive correlation between the IT expertise of staff and technological innovations including E-HRM usage in the organisations (Aboelmaged, 2014; Ahmadi et al., 2015; Askool & Nakata, 2012; Gutierrez et al., 2015; Hameed et al., 2012b; Hung et al., 2010; Kuan & Chau, 2001; Lian et al., 2014; Bian, 2012; Looi, 2005; Oliveira & Martins, 2010; Rahayu & Day, 2015; Teo et al., 2007; Troshani et al., 2011; Zhu & Kraemer, 2005; Zhu et al., 2006). Thus, this discussion leads to the following hypothesis:

H2: IT expertise of HR personnel has influence on E-HRM usage.

3.7.3 Relationship between Relative Advantage and E-HRM usage

Numerous empirical studies examined the influence of relative advantage on technological innovation adoption in different settings. Many previous studies indicate that perceived relative advantage is a crucial factor regarding technological adoption (Aboelmaged, 2014; Ahmad et al., 2014; Ahmadi et al., 2015; Al-Qirim, 2008; Chong & Chan, 2012; Gangwar et al., 2015; Ghobakhloo et al., 2011; Hung et al., 2010; Jeon et al., 2006; Lin, 2014; Looi, 2005; Low et al., 2011; Ngai & Wat, 2006; Oliveira et al., 2014; Rahayu & Day, 2015; Ramdani et al., 2013; Sophonthummapharn, 2009; Teo et al., 2007). In relation to this, the stated hypothesis is perceived relative advantage will promote the increase of the usage of E-HRM.

H3: Relative advantage has influence on E-HRM usage.

3.7.4 Relationship between Perceived Compatibility and E-HRM usage

Lertwongsatien and Wongpinunwatana (2003) stated that if the innovation is compatible with existing work, practices, environments, and firm's objectives, firms will be more likely to adopt them. So, E-HRM technology should be consistent with the needs and the strategic goal of the adopting firm. Incompatibilities with these issues will negatively affect the perception of E-HRM technology and its E-HRM usage. Most studies confirmed that compatibility had a positive association with innovation adoption (Ahmad et al., 2014; Al-Dmour, 2014; Alshamaila et al., 2013; Chong & Chan, 2012; England & Stewart, 2007; Gangwar et al., 2015; Ghobakhloo et al., 2011; Bian, 2012; Ramdani et al., 2013; Sophonthummapharn, 2009; Teo et al., 2007). Therefore, we expect a stronger effect of perceived compatibility on E-HRM innovation adoption in the organisations. These considerations lead to the following hypothesis:

HA4: Perceived compatibility has influence on E-HRM usage.

3.7.5 Relationship between Perceived Complexity and E-HRM usage

Earlier scholars have verified a negative correlation between perceived complexity and adoption of technology innovations. Also, some scholars identified the perceived complexity as a significant factor for any new technology adoption (Al-Dmour, 2014; Chong & Chan, 2012; England & Stewart, 2007; Gangwar et al., 2015; Gutierrez et al., 2015; Lian et al., 2014; Oliveira et al., 2014; Ramdani et al., 2013).

Furthermore, it is advocated that the thoughts about the complexity of an innovation may turn out to become a resistance on the basis of insufficient knowledge and working skills (England & Stewart, 2007). Thus, the above factor has greatly affected negatively the associations with the adapting of the innovation of IS (Grover & Goslar, 1993; Thong, 1999). The expectations are that complexity of the E-HRM perceptions is

negative in relation to the adoption of the firm. As a result, the following hypothesis is presented:

H5: Perceived complexity has influence on E-HRM usage.

3.7.6 Relationship between Perceived Cost and E-HRM usage

In numerous studies, perceived costs were seen to positively or negatively affect the likelihood of adoption of IS (Chong & Chan, 2012; S. Chong, 2004; Clark & Saunders, 1992; Iacovou et al., 1995; Kuan & Chau, 2001; Lin, 2014; Sila, 2013). And, authors have verified a negative correlation between perceived cost and adoption of technology innovations. On the basis of previous findings, smooth E-HRM adoption requires significant administrative and implementation costs and investment in setup, operating and training costs. Organisations perceiving these costs as unduly high or lack the ability to make investments financially have reluctance to E-HRM adoption. An argument by Zhu and Kraemer (2005) stated that the cost of implementation of the essential technologies for online transactions, inclusive of the installation of hardware and software, as well as training of employee, was a substantial barrier for some organisations in adopting E-HRM initiatives. Therefore, we expect a stronger effect of perceived cost for E-HRM innovation adoption in Bangladesh's organisations. The above arguments lead to the following hypotheses:

H6: Perceived cost has influence on E-HRM usage.

3.7.7 Relationship between Top Management Support and E-HRM usage

According to Yap (1989), top management would have the ability of identifying business opportunities for exploiting IT, and their active involvement and support would give suitable strategic vision and direction for new technology adoption and implementation. Usually, systems implementation requires significant changes to

organisational structure, systems of rewards, roles and jobs of employees, control and coordination mechanisms as well as work processes (Maier et al., 2013). Cascio, Mariadoss and Mouri (2010) argue that support for an innovation on the part of top management leads employees to think that the company is making improvements and striving to be successful in the long run, thereby engendering favorable perceptions and attitudes toward the innovation.

Several authors have pinpointed the upper management support's significance in E-HRM planning and implementation in organisations. Most of studies showed a positive impact of the top management support on E-HRM usage (Al-Dmour, 2014; Burbach & Royle, 2014; Chakraborty & Mansor, 2013; Panayotopoulou et al., 2010; Teo et al., 2007; Troshani et al., 2011). In other technology adoption research, noteworthy scholars asserted top management support as being a significant factor for the adoption (Alshamaila et al., 2013; Chong & Chan, 2012; Gangwar et al., 2015; Hameed et al., 2012b; Li et al., 2015; Lian et al., 2014; Lin, 2014; Bian, 2012; Low et al., 2011; Oliveira et al., 2014; Ramdani et al., 2013; Sila, 2013). This discussion results in the following hypothesis:

H7: Top management support has influence on E-HRM usage.

3.7.8 Relationship between Organisational Culture and E-HRM usage

Past research undoubtedly indicates the importance of organisational culture in the context of IS adoption (Leidner & Kayworth, 2006). Moreover, Jackson (2011) stated that organisational culture continues to be cited as an important factor in the success or failure of IS adoption. Organisational culture can support linkages between technology adoption and organisational growth (Chatman & Jehn, 1994), and can thus be a critical success factor in the development and implementation of information systems (Indeje & Zheng, 2010). Consequently, there is a need for understanding how a particular

organisational culture facilitates or limits implementation process of an information system.

There have been supportive findings on the importance of organisational culture in innovation implementation and adoption in the information system literature (ALdayel et al., 2011; Chou, 2003; Indeje & Zheng, 2010; Jackson, 2011; Li et al., 2015; Mayfield et al., 2003; Panayotopoulou et al., 2007). Among the cultural elements, intra-organisational information sharing is widely recognised factor for adopting technology innovations. It includes cross-functional exchange of information. For an effective information system such as E-HRM to perform, the system must be integrated with other internal IS such as financial information system and marketing information system (Teo et al., 2009). Inter-organisational information sharing would include sharing important information with different departments of the organisation. Organisations need to understand that information sharing may potentially benefit for mutual performance gains within the organisation (Li et al., 2015). Hence, an organisation's willingness to share information can have positive relationship with the adoption of any new information system. Therefore, we expect a stronger effect of organisational culture, especially intra-organisational information sharing culture on E-HRM innovation adoption in the organisations. These considerations lead to the following hypothesis:

H8: Organisational culture has influence on E-HRM usage.

3.7.9 Relationship between Centralisation and E-HRM usage

Organisational structure has also been taken into account as significant factor towards the adoption of technology (Dembla et al., 2007). Centralisation is one of the prominent approaches of organisational structure. Previous studies have given ambiguous outcomes with some indicating positive impacts of a centralized

organisational structure (concentration of decision-making) on adoption of technology (King & Sabherwal, 1992; Zmud, 1982), whereas others have indicated negative relationships (Grover & Goslar, 1993; Williams et al., 1998).

In IT adoption research, the examination of influence of centralisation on technology innovation is very limited. However, some earlier scholars attested that centralisation is one of the significant determinants for IT adoption innovation (Askool & Nakata, 2012; England & Stewart, 2007; Etllie et al., 1984; Pierce & Delbecq, 1977; Troshani et al., 2011; Zmud, 1982). Consequently, the following hypothesis is offered:

H9: Centralisation has influence on E-HRM usage.

3.7.10 Relationship between Competitive Pressure and E-HRM usage

Researchers attested that the external factors have the potential to directly affect the organisation's decision of innovation adoption. As an external factor, the competitive pressure faced by an organisation is a powerful incentive towards adopting relevant new technologies (Oliveira et al., 2014). Earlier empirical studies have suggested the significance of competitive pressure in adopting a new technology, and competitive pressure is identified as one of significant adoption factors (Al-Qirim, 2008; Askool & Nakata, 2012; Chong & Chan, 2012; Gangwar et al., 2015; Ghobakhloo et al., 2011; Gutierrez et al., 2015; Lin, 2014; Bian, 2012; Looi, 2005; Low et al., 2011; Oliveira & Martins, 2010; Ramdani et al., 2013; Sila, 2013; Sophonthummapharn, 2009; Zhu & Kraemer, 2005; Zhu et al., 2006).

Bases on the above findings, competitive pressure positively affects the adoption of IT particularly in the event technology directly influences the competition, and stands out as a strategic requirement in the adoption of new technologies to remain competitive in the market (Ramdani et al., 2013). Adopting IS in business operations is useful for a

firm to alter the competitive environment in terms of rules of competition, industry structure and outperforming their competitors (Pan & Jang, 2008). Thus, first-movers in the implementation of E-HRM have a tendency of deriving substantial advantages with regards to competitive advantages and smooth survival. So, the following hypothesis is proposed:

H10: Competitive pressure has influence on E-HRM usage.

3.7.11 Relationship between Technology Vendor Support and E-HRM usage

Earlier research reported that small firms are generally faced with difficulties in terms of recruiting and retaining internal information system experts because of their lack of experience with the equivalent technology (Attewell, 1992). So, SMEs may rely significantly on external support. But, sometimes, these firms usually do not have the capacity of affording costs that comes with hiring external IT expertise for provision of employee training as well as to assist them with the adoption of IS because of their financial constraint (Thong & Yap, 1995). Thus, technology vendors may be considered as the primary external IT expertise source. Technology vendors have the potential to assist organisations by developing the capability of solving their concerns and achieving a rewarding implementation experience. This is through the provision of training to end user, advocating IT applications' innovative use and generally preparing firms into being more receptive to change (Aboelmaged, 2014).

Prior scholars examined the influence of technology vendor support on technological innovation adoption in different settings. Almost all previous studies have demonstrated that technology vendor support is a significant technology adoption determinant (Al-Dmour, 2014; Alshamaila et al., 2013; Chang et al., 2007; Costa et al., 2004; Ghobakhloo et al., 2011; Sophonthummapharn, 2009). In agreement with this, it is hypothesised that technology vendor support will likely increase the E-HRM usage.

H11: Technology vendor support has influence on E-HRM usage.

3.7.12 Relationship between E-HRM usage and Organisational Performance

In the current times, almost all organisations have subscribed to the E-HRM's services in supporting HR department towards performing key functions of the HR, facilitating administrative efficiency and improving making of decisions, as well as propelling the sharing of information (Lengnick-Hall & Moritz, 2003). Chugh (2014) stated that the reduction of workload by minimising repetitive tasks of the administration, is one of the major advantages of E-HRM. A study by Sadiq, Khan and Mujtaba (2013) between the impact of information systems and HR department performance, based on responses from 18 HR managers employed at the different corporations running in Lahore, Pakistan. The findings proposed the implementation of HRIS as a tool towards achieving greater administrative efficiency through the addition of values in the department. Similarly, the research, conducted by Gardner et al. (2003) on virtual HR, suggested the use of IT in HRM functions by those HR professionals that permits accessing and disseminating relevant information more efficiently. Aside from the significant usage of IT in the HRM functions, in most cases training and development aspect cost-effectively gets support from IT.

Ruël and van der Kaap (2012) validated that E-HRM usage has substantial contribution to the creation of efficiency, based on effectiveness, and the quality of HR service in a firm. The explorative factor analysis was utilised in the identification of the three dimensions (effectiveness, efficiency, and HR service quality) of the dependent variable, creation of HRM value. The researchers tested their hypotheses with the use of a hierarchical regression analysis of 151 valid questionnaires. They also argued that E-HRM is considered as a driving force behind HRM value creation; by which human

capital expedites the achievement of the firm's goals (aligned with its business strategy). These considerations lead to the following hypothesis:

H12: E-HRM usage has influence on organisational performance.

3.7.13 Job satisfaction of HR personnel acts as the mediator variable on the relationship between E-HRM usage and organisational performance

To examine the mediation effect, hypothesis 13 is comprised of 13(a) and 13(b). The implementation of E-HRM in an organisation ensures a concrete change situation influencing work-based outcomes. The perception of an individual and general HRIS evaluation as an object of change affects that particular individual's job satisfaction during and after implementation of the system (Maier et al., 2013). So, there is an assumption that the attitude of an employee regarding the E-HRM has an effect on the variable – job satisfaction. Beckers and Bsat (2002) employee satisfaction keeps decreasing while the use of E-HRM is difficult. There exist multifaceted reasons for the probable changes in job satisfaction during E-HRM implementation.

An E-HRM necessitates the need for employees to changing work habits and adjusting to a new workflow (Wiblen et al., 2010). Learning new routines necessary in dealing with the E-HRM leads to increases work and additional stress. It forms one reason for the resistance of the HR employees in utilising an E-HRM (Ngai et al., 2008), as they rarely see work routines business processes that are reengineered in a positive and smooth light. As a consequence, it may result in lower employee's job satisfaction during the E-HRM implementation (Maier et al., 2013). Nonetheless, the extent or operation mode of these influences is dependent on the degree of employee's acceptance of the E-HRM-induced change (Wanberg & Banas, 2000). An assumption in this study is that changed job situation perceived positively results in increased job

satisfaction, while negative attitudes regarding the E-HRM lessen job satisfaction. Therefore, our next hypothesis is based on TAM (Davis et al., 1989).

HA13 (a): E-HRM usage has impact on job satisfaction of HR personnel.

Earlier research revealed that an E-HRM implementation has a profound impact on the employees based on job satisfaction and turnover intention (Maier et al., 2013). So, job satisfaction with newly implemented system is now prime concern in technology adoption research. Various authors have given suggestions that personnel satisfaction and happiness in an organisation results in increased organisational performance. Generally, evidence proposes that satisfied followers have a high likelihood of contributing to the of organisational effectiveness improvement. Job satisfaction makes the employees to work harder hence improving the organisational performance (Motowidlo, 1984; Petty, McGee & Cavender, 1984). On the basis of a meta-analytic review, the findings by Petty et al. (1984) indicated a relation between job satisfaction and performance. In the public sector domain, a study by Kim, Leong and Lee (2005) empirically agrees that increasing job satisfaction and organisational commitment of employees in public organisations will improve the organisational performance.

Various authors have indicated that employee job satisfaction and commitment to the organisation might have a positive effect on organisational performance. This is because employees having job satisfaction and organisational commitment at high levels have a higher willingness to work toward shared goals and objectives. Besides, they wholeheartedly give their contribution to the firm and to the public, hence enhancing organisational performance (Muterera, Hemsworth, Baregheh & Garcia-Rivera, 2015; Petty et al., 1984). Therefore, employees who are more satisfied will have a high level of willingness and capability of engaging in behaviours crucial to organisational success. In the same vein, Chang et al. (2012) investigated employee job satisfaction for

using information system in Hospital of Taiwan. They revealed that employees' job satisfaction with information system has significant impact on employee performance and their work commitments. The contemporary study conducted by Shiu and Yu (2010) attested that job satisfaction of an employee positively impact organisational performance in Taiwan. Similarly, a study on 1,364 government employees in the United States revealed that job satisfaction is positively related to organisational performance (Muterera et al., 2015). With the same thought, Rodrigues and Carlos (2010) investigated the relationship among job satisfaction, commitment, market orientation and organisational performance on Portuguese government employees. They concluded that job satisfaction is directly and positively affects organisational performance. Consistent with the literature noted earlier, we developed the below hypothesis:

H13(b): Job satisfaction of HR Personnel has impact on organisational performance.

3.7.14 The Moderating Effect of Business Experience with E-HRM on the Relationship between E-HRM usage and Organisational Performance

In a research of e-commerce in Malaysian tourism industry, Salwani et al. (2009) proposed the experience of e-commerce as a moderating variable. They investigated the moderating impact on the association between e-Commerce usage and business performance. The findings indicated a strong contingent impact on the association between e-Commerce usage and business performance. In the same vein, IT experience was formed as one of the key factors with significant effect on HRIS implementation of Jordanian firms (Al-Dmour, 2014). However, prior study by Kauffman et al. (2002) on firm's survivability using evolutionary game theory concluded that trial and error process resulted firms to realise the survivability factors through exploration, experimentation, examination of market and performance feedback, and competitors' experience. With the same thought, for the present study, moderator variable business

experience with E-HRM usage (measured in number of years) was proposed in identifying if its inclusion would substantially moderate the "E-HRM usage-organisational performance" relationship. So, following hypothesis is proposed:

H14: Business experience with E-HRM acts as the moderator on the relationship between E-HRM usage and organisational performance.

3.8 Questionnaire Design

The questionnaire is regarded as a basic technique of data collection and tends to be the most popular method (Hair et al., 2010). For this research, the structured questionnaire was sent to target respondent of companies of Bangladesh in order to collect the relevant data. Sekaran and Bougie (2010) suggested that several principles need to address while gathering data using a structured questionnaire. The questionnaire survey was applied for the main purpose of receiving sincere feedback and in a straightforward manner from the HR mangers who were appointed to play the role as representatives on behalf of their companies. They were requested to present data about the factors that influence management for E-HRM usage, and its impact on organisational performance. Questionnaire survey is appropriate for the current study since it is a more cost effective method which can increase response rate (Sekaran & Bougie, 2010).

In the introduction section of survey questionnaire, a brief description of researcher's introduction is provided. This section also contains purpose of this survey so that respondents can imitate the importance of his response. In addition to that confirmation of the confidentiality of the respondents' information was given. On top of these, instructions on how to answer each question without having much stress and consuming less time were provided.

During selection of language level for writing the questionnaires, targeted respondents' level of understanding was given priority. Here, both Bengali and English languages were chosen for the respondents to communicate comfortably. All the questions were in closed-ended question format except one. To measure the dependent, mediating and independent variables, a seven-point Likert-type scale was utilised. For examples,

Open-ended Question:

How long your organisation has been using E-HRM application? _____Years

Closed-ended Questions:

Perceived Complexity:

Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree Nor Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1	2	3	4	5	6	7
The development of E-HRM applications is a complex process.					1 2 3 4 5 6 7	

E-HRM Applications Usage:

Not used at all	Below 10%	10% -20%	21%-30%	31%-40%	41%-50%	Above 50%
1	2	3	4	5	6	7
Recruitment and selection					1 2 3 4 5 6 7	

Organisational Performance Indicator:

Significantly below Average	Quite below Average	Slightly below Average	Average	Slightly above Average	Quite above Average	Significantly above average
1	2	3	4	5	6	7
Satisfaction					1 2 3 4 5 6 7	

The questionnaire consists of four sections in which each section headlined by a particular heading. All the headings supplemented by explicit instructions to suit the convenience of the respondents. In this study, the section A was positioned at the beginning of the questionnaire. This section includes 10 questions that refer to companies' basic information and respondents' demographic data namely. Section B

classifies 11 factors of E-HRM usage under human, technological, organisational, and environmental contexts. This section includes 53 items under 11 questions. Sub-section B1 represents nine items that measure two human factors whether they have influence on E-HRM usage. In sub-section B2, 20 items indicates four technological factors of E-HRM usage decision of companies. In addition, sub-section B3 refers three organisational factors with 14 items. Lastly, sub-section B4 indicates 10 items of two factors that are used to measure their influence on managerial decision for adopting E-HRM applications in companies. Section C shows seven E-HRM application modules, and respondents were asked to indicate to which extent their organisation have implemented/used these application modules. In the last section, six non-financial performance indicators are provided in order to evaluate the company's recent (last three years) organisational performance relative to their key competitors in the industry.

In the demographic questions, respondents' personal questions i.e. age, gender, level of education and job experience were included. These questions will help in future to describe respondents' characteristics. Here, respondent's name was not asked sustain confidentiality. Often, these demographic questions are named as personal data or classification data.

In this research, direct questions in the format of ordinal scaled data were asked. Normally, either subjective feelings or objective facts were asked in the survey questionnaire. Here, objective data was asked in the format of demographical variables from the respondents.

Survey questionnaires are of two types: positively worded questions and negatively worded questions. Most of the questions in this research are in positive format excepting only a few negatively worded questions.

At the end of the questionnaire, a sincere expression of thanks to the respondents was shown. A polite reminder was also addressed in order to confirm that all questions were answered duly by the respondents.

3.9 Validity and Reliability Assessment of Questionnaire

The following sub-sections discuss the validity and reliability of the survey questionnaire. These tests allow to confirm the data set to be valid suitable for conducting the research and test hypothesis.

3.9.1 Assessment of Questionnaire Validity

Initially, content validity was carried out. According to Cavana et al. (2001), content validity refers to the representativeness or sampling adequacy of the questionnaire. This helps in confirmation of theoretical construct. Cavana et al. (2001) recommended two major approaches for examining content validity wich was followed in this study. First, all the items that measured the variables of interest in this study were taken from past research after studying the evolution of those variables. Most well-known measurements were used for the variables. Despite this, additional validity assessment was felt needed because variables in this study were never before used together in such a combination.

Second, the 'expert judgment validity' is tested. In this process, the structure questionnaire was sent to a group of scholar in the related field of E-HRM. They gave judgement based on their knowledge and expertise to confirm the rationality of the theoretical support of this questionnaire.

Next, questionnaire which was developed earlier in English language was translated into the Bengali by a professor of IT so that the respondents find it easy and can provide absolute feedback on each question. Then, the translated questionnaire was sent to six

expert members who were involved in E-HRM/ERP implementation projects in Bangladesh.

Their expert opinion were asked to finalise the questionnaire. Copying the suggestion from these experts, total 25 changes were made (Table 3.16). These changes were mostly formatting and grammatical related. The experts were also suggested to remove six items from the existing questionnaire. Finally, the same professor who translated the questionnaire earlier was asked to retranslate the final version of the questionnaire into English from Bengali. This back and forth process of translation and expert opinion helps in achieving persistence and accuracy as much as possible in both English and Bengali version of questionnaire.

Table 3.16: The Change Summary in the Questionnaire for Content Validity Assessment

No.	Subject	Initial Items	Items Dropped	Items Added	Items Edited	Final Items
1	Demographic Data	9	-	1	1	10
2	Senior executives' characteristics	6	1	-	2	5
3	IT expertise of HR personnel	4	-	-	3	4
4	Relative advantage	7	-	-	3	7
5	Perceived compatibility	5	-	-	2	5
6	Perceived complexity	5	1	-	1	4
7	Perceived cost	4	-	-	2	4
8	Top management support	5	-	-	3	5
9	Organisational culture	5	-	-	2	5
10	Centralisation	5	1	-	-	4
11	Competitive pressure	5	-	-	-	5
12	Technology vendor support	5	-	-	-	5
13	E-HRM usage	10	3	-	2	7
14	Organisational performance	6	-	-	2	6
15	Job Satisfaction of HR Personnel	3	-	1	2	4
Total		84	6	2	25	80

3.9.2 Assessment of Questionnaire Reliability

Reliability analysis is concerned with ensuring consistency of the measurement instrument. Reliability analysis is carried out for all the variables in this study. There are three different methods for assessing reliability of a measurement scale: test-retest, internal consistency and alternative forms (Peter, 1979). Internal consistency is the most common method of assessing reliability of a scale and it draws on the homogeneity of a set of items and is expressed as a number between 0 and 1 (Hair et al., 2010). When all the statements (items) in a test comprises with a single concept, it is assumed that there is inter-relatedness of the items within the given tests. This inter-relatedness among the items is also known as internal consistency. Cronbach's Alpha (Cronbach, 1951) provides a measure of the internal consistency of a test or a scale (Sekaran & Bougie, 2010). In this study, reliability is measured by the value of Cronbach's Alpha (α) which is required to achieve a level greater than 0.7 for the items of the variables to be accepted as reliable (Hair et al., 2010; Sekaran & Bougie, 2010). Otherwise, the items of the variables needs to be deleted as suggested by the analysis until finally the value of α for each variable is accepted.

Even though the measurement instrument for the variables are adopted and adapted from past studies, reliability analysis is still required to be carried out. This is because, the target population and scope of the study is different from past studies. As such, there could be items that may not be applicable or relevant within the context of this study.

As can be seen in Table 3.17 (results of Pilot study, n=111) , the results confirmed that all variables had high rates of Cronbach's alpha (above the 0.7 level). So, the questionnaire was considered as reliable as suggested by Hair et al. (2010).

Table 3.17: Results of Pilot Study (n=111)

Variables	No. of items	Cronbach's Alpha
Senior executives' characteristics	5	.795
IT expertise of HR personnel	4	.887
Relative Advantage	7	.872
Perceived compatibility	5	.845
Perceived complexity	4	.876
Perceived cost	4	.847
Top management support	5	.896
Organisational culture	5	.915
Centralisation	4	.855
Competitive pressure	5	.914
Technology vendor support	5	.917
E-HRM usage	7	.923
Organisational performance	6	.873
Job satisfaction of HR Personnel	4	.806

3.10 Pilot Study

The final draft of the questionnaire was subsequently tested in a pilot study after an acceptable content validity established. During data collection phases traditionally starts with a pilot test. Pilot test helps in identifying errors in designing the instruments and improve the overall questionnaire development (Cooper & Schindler, 2003; Sekaran & Bougie, 2010). It ensures 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 respondents of HR managers. Cooper and Schindler (2003) revealed that the pilot test might be in the range of 25 to 100 respondents. There is no statistical selection process in determining the number of pilot test respondents. According to Rossi, Wright and Anderson (2013), 20 to 50 respondents are adequate for conducting pilot test.

In the pilot survey of current research, 111 successful questionnaires were received from 36 companies (both local and foreign companies) in Bangladesh. Our desired respondents were three types of HR managers (First-line managers, Mid-level managers, and Top-level managers) who are related to E-HRM adoption and implementation. The respondents took 30 minutes approximately to fill in the whole questionnaire. To ensure the reliability of informants, the respondent was selected who had three years working experience in the same organisation. The fitness criteria of the participants and representativeness of population were ensured in this study.

The face-to-face survey is the most reliable way for conducting survey (De Leeuw & Van der Zouwen, 1988). In this process, an interviewer conducts personal interview of the respondendts by physically traveling to the respondents' locations (Fowler Jr, 2013). De Leeuw and Van der Zouwen (1988) recommended a face-to-face survey technique because it has control over the data quality: both in the process of collection and environment. Comparing to the mail survey or telphone survey, face-to-face survey offers a number of benefits. For example, it is often reporting that respondents might be careless in time of filling out the questionnire: skipping questions if it finds out difficult to understand or repeating by the respondents; making calls while answering the questions; watching televisions or surfing internet during a telephone survey, etc. However, a face-to-face personal interview can eliminates all of these errors in data collection: complexity in understanding of questions or respondents' handwritings can easily be clarified and for any missing data, interviewer can simply ask the respondents. However, these banefits in face-to-face interview demands for more logistic supports and costs. Additionally, since the respondent is in contact with the interview, a potential response bias is common (Fowler Jr, 2013).

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 respondents were subsequently gathered and constructively reviewed prior to the adjustments made. Eventually, the initial instrument was further amended based on useful feedback and comments received from the 111 informants within companies. The adjustments brought about an overall improvement in relation to the structure of the questionnaire. For example, question layout, line spacing, font size and content clarity. In addition, the appropriateness of the language is also achieved. It is important to note that participants who were involved in the pre-test procedure are deliberately excluded from the main survey.

3.11 Questionnaire Distribution

The companies which have been using E-HRM were targeted for data collection. Similar to the questionnaire development, the Head of HR was informed about the identity of the researcher and the purpose of the study before collecting the responses. This help in confirming why and how these data will be kept confidential. Total number of E-HRM users of these companies was known also from the Head of HR. In some cases, the liaison person sits in a meeting for understanding the survey method: distribution; reporting the questions; collection of the questionnaire. Alternatively, the liaison person gets this information via telephone conversation.

About 665 questionnaires were distributed among three level of management (first-line manager, middle-level manager, and top-level manager) from HR department. Another criterion was that the respondents should have served at least three years in the same company. For collecting the completed questionnaires, the liaison persons were requested. The online survey was not used because of most of HR managers, especially

top level HR managers, were identified as unfamiliar with online survey. On an average 50 calls were received from the liaison person for clarifications on different issues. For follow up, roughly three rounds of communications were performed with the help of telephone and emails. A total 584 completed questionnaires (87.8 %) were collected during September 2015 to December 2015.

3.12 Data Analysis Techniques Used

The data collected for this study were analysed quantitatively. As mentioned earlier, this study has eleven independent variables, one intervening, one dependent, one moderating and one moderating variable. To analyse the data related to all these variables, several statistical techniques were used. SPSS- Statistical Package for the Social Science, version 20 and AMOS- Analysis of Moment Structures, version 20 were used to run the relevant statistical tests.

The next section provides a brief overview of the main data analysis techniques used in this study. SPSS is used to verify the reliability of the pilot test and to examine several multivariate analyses in final study. It is also used to produce the results of descriptive statistics and tests of difference. AMOS was used for Structural Equation Modelling (SEM).

3.12.1 Exploratory Factor Analysis

An underlying structure in a group of variables can be defined using the most popular interdependence technique called Exploratory Factor Analysis- EFA (Hair et al., 2010). EFA also helps in analysing long list of variables to extract only the variables which are mostly interrelated. These highly interrelated variables are commonly known as factors. In other words, EFA helps to reduce dimension of long list of variables into a small set of factors which in turn can be used to experiment and establish relationships in variables.

In this study, EFA was performed for eleven independent variables and one moderating variable. Some of independent variables such as IT expertise of HR personnel, perceived compatibility, perceived costs, organisational culture, competitive pressure, and technology vendor support include two instruments of different authors. Moreover, these instruments were used at different setting but related IS research. Besides, the mediating variable also slightly modified instrument. So, the relationship between convergent validity and dimensionality between constructs and items is confirmed using EFA. Besides, factor analysis was not used for organisational performance variable (dependent variable) due to the fact that there is an obvious distinction among the items; all are nonfinancial measures. This method has been used in the past organisational performance research (Asiaei, 2014). Similarly, EFA was not performed for the intervening variable - E-HRM usage due to obvious distinction among the items (HR functions).

EFA is measured based on Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and test of significance at 95%. According to Hair et al. (2010), the instrument is regarded as adequate when the value of KMO is between 0.5 to 1.0.

3.12.2 Structural Equation Modelling and Confirmatory Factor Analysis

The process in SEM analysis can be categorised in five major steps: specification, estimation, evaluation, interpretation, and reporting (Hoyle, 2012). Sometimes, an additional step added in the model named re-specification in case the model is not fit. These steps are described in brief as follows.

I) Model Specification: Specification of the model is the initial step of EFA. Any research model can be graphically presented once existing literature and theories support the model. This means, relations among the variables and their state of parameters are shown in the model assigning variables either into latent or observed

variable group. The process of putting variables into the above mentioned groups largely dependent on the nature and relationships among the variables. At the end, the status (generally, the value came from proxy value given by the researcher) of the parameters are given.

Our main research objective is to examine the factors identifying E-HRM usage and its impact on organisational performance in Bangladesh. The first objective is to explore the important factors that have influence on E-HRM usage. Based on extensive literature review, eleven factors are selected. The second objective is to find the relationship of the E-HRM usage with the organisational performance. Here, the level of E-HRM usage is measured by seven modules. Organisational performance is measured by six non-financial indicators. The third objective is to examine the mediating effect of job satisfaction of HR personnel on the relationship between E-HRM usage and organisational performance. The fourth objective is to investigate the moderating effect of business experience with E-HRM on the relationship between E-HRM usage and organisational performance.

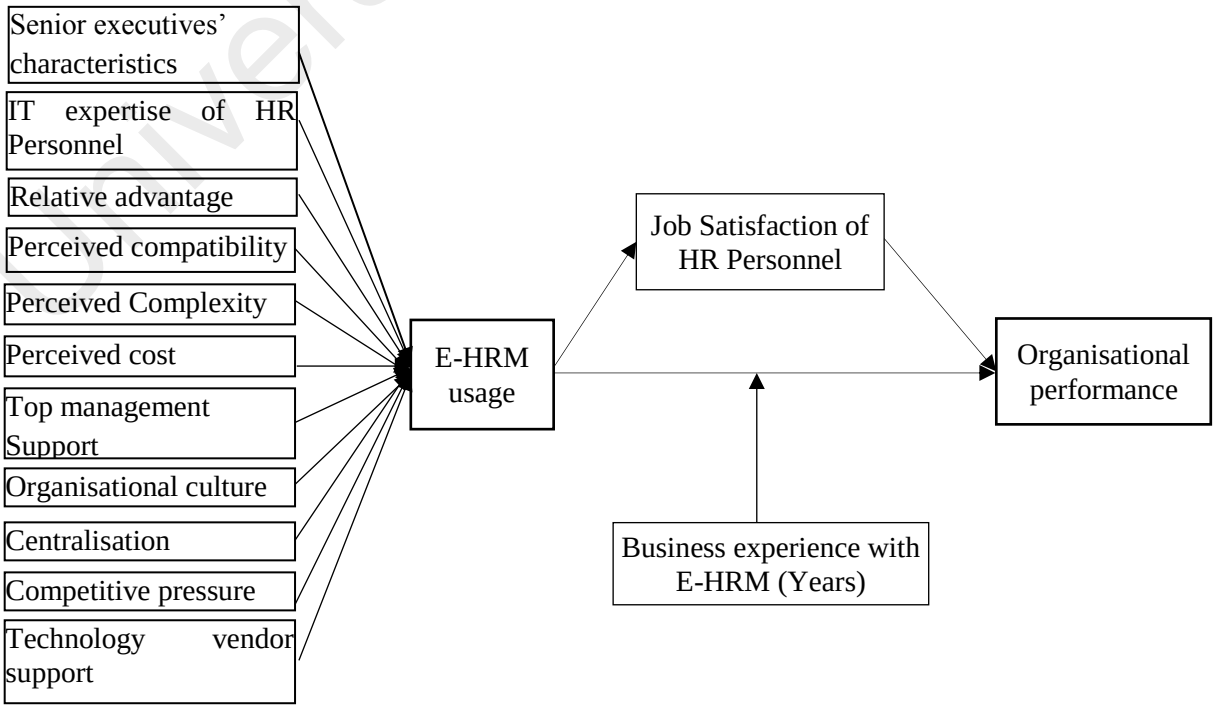


Figure 3.2: Conceptual Model of the Study

Figure 3.2 conceptualises the relationship of each of the independent variable of the different factors with the E-HRM usage. It also conceptualises the direct and indirect effect of E-HRM usage on organisational performance. Here, there is eleven independent variable, one intervening, mediating, moderating, and dependent variable. In this way, a total of 14 hypotheses needed to be tested in Figure 3.2. The details of the hypotheses appear in section 3.7. After specifying them, the next step of the model is to collect the data for further analysis.

II) Model Estimation: Once model specification and data collection are completed, the model needs to be examined using the given statistics. Generally the most popular application of EFA is the Maximum Likelihood Estimation for extracting the variables because of its un-biasness in result preparation. This process assumes that the multivariate normality is existed within the examined data set.

III) Model Evaluation: There are two stages in model evolution. First, every latent variable along with the measurement model need to be validated. In the second stage, the valid measurement model needs to be combined with the variables with which the relationship was developed as to be examined. In the second stage, all independent, intervening, dependent and moderating variables needs to be combined in a measurement model to examine construct validity.

a) Validating Measurement Model: With the help of CFA, each construct of the measurement model is validated.

   Conceptually, CFA helps in examining a set of items to test whether the theoretical latent construct was ascertain. This process is also known as construct validity. For construct validity, Hair et al. (2010) recommended for nomological validity, convergent validity, model goodness-of-fit and discriminant validity. For

Convergent validity examination of factor loading, AVE and CR are needed. The discriminate validity can be tested by comparing AVE and correlation scores between constructs. The goodness-of-fit is also checked using different indicators. From literature, a number of goodness-of-fit tests are recommended by SEM. Since there is no fixed indicator is accepted by the majority of the researcher, mulitple popular indices were applied in this study. However, Hair et al. (2010) recommends for the chi-square value and degree of freedom for justifying the results. Major indicators of model fit are presented in Table 3.18.

Table 3.18: Measurement Indices

Index Name	Level of acceptance	
Chi-Square	p>0.05	Hooper, Coughlan, and Mullen (2008), Cheung & Rensvold (2002)
Ratio Chi-Square/df	CMIN/DF <3	Hair et al. (2010)
Comparative Fit Index (CFI)	CFI > 0.90	Bentler (1990)
Goodness-of-fit Index (GFI)	GFI > 0.90	Bentler and Bonett (1980)
Root Mean Square of Error Approximation (RMSEA)	RMSEA<0.08	Browne and Cudeck (1992)
Factor Loading	>0.50	Hair et al. (2010)
Cronbach alpha	Cronbach alpha >0.70	Cronbach (1951)

b) Structural model: After validating, to form a structural model, each measurement model is joined together according to the relationship previously conceptualised from the theory. Now this structural model not only tests the theory and structural relationships among variables but also checks the measurement relationships of indicators to the constructs. To analyse the structural model, the SEM uses the Maximum Likelihood Estimation (MLE). After obtaining the results of the ML estimation, the first fitness of overall mode is ascertained by analysing the results of the indices discussed in Table 3.18. It is worth mentioning that in case the overall

structural model lacks in goodness-of-fit, the results obtained from such a model will be spurious.

IV) Interpretation and Reporting: It is not sufficient if only a good model fit is obtained during structural model. Examining regression model to confirm the relationship (direct, indirect and total) among the variables is also importance. Here, p-value and the beta coefficient is always need to be significant in order to analyse and validate the relationship. As for the rule of thumb, p-value of less than or equal 0.05 is considered as significant especially in the social science studies.

3.12.3 Examination of Moderating and Mediating Effect

The hypothesised model of the present research contained also a mediating variable which affects the relation between the independent and dependent variables. Figure 3.3 is an illustration of a mediator model. In this study, job satisfaction of HR personnel is a mediating variable. To examine the mediating effect, the direct effect of independent variable (E-HRM usage) on dependent variable (organisational performance) is examined. Again, an indirect effect of independent variable (E-HRM usage) on dependent variable (organisational performance) is examined. Supporting the earlier research, Coltman, Devinney and Midgley (2011) argued that mediation occurs in the following conditions:

1) If a regression on dependent variable (DV) shows a significant effect where mediating variable is independent one.
2) If significant effect of independent variable (IV) is obtained over the dependent variable. This condition is also known as the effect to be modified.
3) If the regression result shows that both independent and mediating variables have a significant effect on the dependent variable

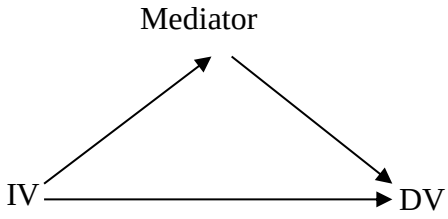


Figure 3.3: A Three-variable Mediating model

Source: Zhao et al. (2010)

The hypothesised model of the current research contained a moderating variable (business experience of E-HRM usage) which affects the relation between the independent (E-HRM usage) and dependent variables (organisational performance). The property of a moderating variable is shown in Figure 3.4. The commonly used guideline for testing moderation was provided by Chin, Marcolin and Newsted (2003). In brief, each indicator is normalised by subtracting the average of each indicator and dividing by its standard deviation. Then, by multiplying the value of each of the composed indicators the interaction construct is created.

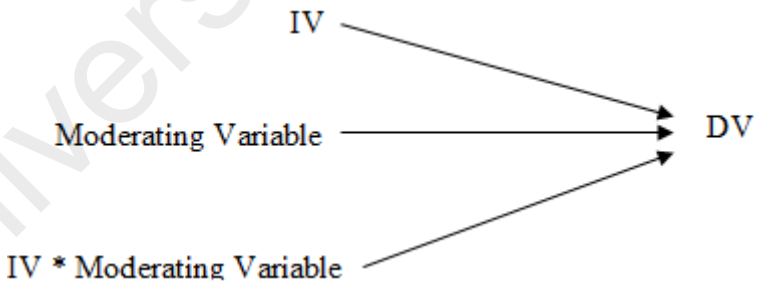


Figure 3.4: Moderator Model

Source: Baron and Kenny (1986)

3.12.4 SEM Assumptions

Among the assumptions for SEM, the first thing is for size of data sample. It is assumed that sample size is large enough to be fit for the model. According to Hair et

al. (2010), the sample size of SEM needs to be much larger compared to any multivariate tests. Hair et al. (2010) also suggests that minimum 100 sample is required for SEM testing. Again, a sample size of 100-150 is recommended by Lacobucci (2010). In this analysis, the current sample size is 554. Thus, it can be assumed that the requirement is fulfilled.

There are some preconditions on the number of items used in SEM analysis. Lacobucci (2010) revealed that inappropriate selection of items for any study can cause problem in result accuracy. Ideally, the minimum required items in a construct should not be less than three. For a model to be accepted in a literary way, some validation needs to be established between items and the construct.

Finally, SEM requires normality in data because without normal distribution, the results and the construct development might face biasness by turn in chi-square statistics: the coefficient significance and standard errors (Hair et al., 2010).

3.12.5 Justification for Using SEM in this Study

The popularity of SEM in resent era of social science research is due to the proliferation of cause and effect nature of research problem. In comparison to regression analysis, a variable can be either independent or dependent, but not both. However, SEM can combine factor analysis and multiple regressions simultaneously. Moreover, in SEM analysis, a set of variables might be used to predict a pair of outcomes which is considered as the dependent variables when it is used to predict the other dependent variable (Hoyle, 2012).

Both factor analysis and regression analysis can be generalised in SEM. In addition, SEM works for prediction with a psychometric perspective were a number of observed variables are employed for testing a latent or unobserved variable using a restricted

factor analysis (Hoyle, 2012). In SEM the application of CFA is common as part of the above restricted factor analysis. The benefit of allying CFA is that only the relationship between latent variables and their items gets priority. The exploratory factor analysis (EFA) has a major drawback- infinite number of factor scores (Steiger & Schönemann, 1978). It also requires the uniqueness to be uncorrelated. Keeping in view these limitations, the SEM models latent variables in a more flexible, mathematically defensible manner allowing a wide array of models that could not be evaluated using the EFA. Also, this approach simultaneously copes with the issues of construct measurement and the structural relationships among the constructs.

Last but not least, this study involves with a research design involving with dependence and mediating relationship. Here, both E-HRM adoption was modelled and SEM can validate the application. Moreover, the impact of E-HRM on organisational performance was tested while incorporating job satisfaction as a mediating variable. Besides all, testing model fit in SEM is comprehensive (Malhotra, 2010). This means, survey data can be addressed in an intensive manner.

3.13 Chapter Summary

The chapter was begun with a discussion on the research design of the study which included explanations regarding research paradigm, research approach, research methodology, sampling method and target population. The theoretical framework of current study is depicted carefully. Subsequently, operational definitions for the variables were given. After that, the research hypotheses were developed. Furthermore, the survey instrument was designed. The validity and reliability was also examined with the help of pilot study and expert opinion. 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 organisational aspect are presented. After that, the exploratory factor analysis for some certain variable of the study is presented followed by the related CFA. Next, SEM technique is utilised 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 4: DATA ANALYSIS

4.1 Overview

The earlier chapters have presented the conceptual framework of this research, operational definitions of the variables, research hypotheses, and research methodology. This chapter presents the data analysis. The following sections cover the results of every test which is carried out. Section 4.2 describes data coding, reverse scoring of negatively-worded items and missing values. In the following section 4.3, descriptive statistics is presented by giving a summary of the demographic profile of the respondents and the firms that participated in this study. Section 4.4, examines multivariate assumptions including normality, linearity, homoscedasticity, outliers and multicollinearity. The fifth and the sixth sections present the results of the tests for common method bias and non-response bias respectively. In the seventh section, purity of the scales is assessed. Section 4.8 presents the results of exploratory factor analysis used for some selected variables of this study. Subsequent section reveals the confirmatory factor analysis of individual measurement models with all variables. The construct validity including discriminant validity and convergent validity are also discussed in section 4.10. In sections 4.11-4.13, the structural models are discussed. The hypotheses of this study are tested in section 4.14. Last but not least, this chapter also includes a summary of results.

4.2 Data Preparation for Data Analysis

Before conducting any statistical analysis, data was prepared by coding, editing and cleaning with the help of statistical package version SPSS 20. The following paragraphs briefly discuss data preparation in these stages. This process of data preparation was to ensure that data are error free and potential problems that might affect the results could be avoided.

To transcribe the data from the questionnaire, a coding sheet was used (Sekaran & Bougie, 2010). Data coding involves assigning numerical values against the respondents' answers to the questions in the questionnaire. The coding and numbering systems were in accordance with the sequence of the questions. A code has been assigned to each individual response for each question. Responses for all items/ questions (of demographic, independents, intervening, dependent, mediating, and moderating variable) were coded as illustrated in Table 4.1.

A total of 80 items/questions were manually keyed into the SPSS. The data entry process was double checked to minimise input error. Then, a frequency distribution for each variable, and the missing value analysis were run so that the data are 'clean'. Moreover, responses to some of the negatively worded questions were included so that all answers do not remain in the same direction. For instance, if a respondent ticks 6 among (1-7) on a seven points Likert-type scale, which indicates 'moderately agree', really means 'moderately disagree' which is actually a 2 among (1-7) on the seven points scale. Thus, all the negatively worded items of the questionnaire were reversed to positively worded questions. This was done by the SPSS 22.0 software through the 'Recode' function. As such, scores of 7 were read as 1; 6 as 2; 5 as 3; 4 as 4; 3 as 5; 2 as 6; and 1 as 7.

Furthermore, all questionnaires were reviewed to find the most likely blank items. After examining all 584 filled questionnaires, 30 questionnaires were found disqualified due to the existence of a lot of unanswered questions (Sekaran & Bougie, 2010). Also, there were 23 questionnaires which contained a few blank items. For questionnaires with less than 5% unanswered, the average score was assigned to manage blank responses (Sekaran & Bougie, 2010). This method was plausibly performed largely due to limitations to contact respondents. For these cases, 'Replace missing value' of the

SPSS software was used. Lastly, an open-ended question was included at the end of the questionnaire to allow the respondents to express the issues. However, none of the respondents offered any specific answer.

Table 4.1: Codes Used for Transcription of Data from the Questionnaire

Item / Variable	Categories	Code
Gender	Male	1
	Female	2
Age	Below 30 years	1
	31-40 years	2
	41-50 years	3
	Over 50 years	4
Level of education	Bachelor's degree	1
	Master's degree	2
	M.Phil. degree	3
	PhD. degree	4
Employment with this company	Less than 3 years	1
	3-5 years	2
	6-10 years	3
	over 10	4
Current job position	Non-executive	1
	First -line manager	2
	Mid-level Manager	3
	Top-level Manager	4
E-HRM use period	About 1 year	1
	2 years	2
	3 years	3
	More than 3 years	4
Ownership Structure	Government-linked company	1
	Local ownership	2
	Foreign ownership	3
	others	4
Company Size (employee)	Less than 100	1
	100-499	2
	500 – 999	3
	More than 1000	4
Organisation type	Banking/finance	1
	Construction/Engineering	2
	Education	3
	Hospital	4
	Hotel	5
	Logistics	6
	Manufacturing	7
	Telecommunication	8
E-HRM usage factors at organisation level	Strongly disagree	1
	Moderately disagree	2
	Slightly disagree	3
	Neither Agree Nor Disagree	4
	Slightly agree	5
	Moderately agree	6
	Strongly agree	7
E-HRM applications usage	Not used at all	1
	Below 10%	2
	10% -20%	3
	21%-30%	4
	31%-40%	5
	41%-50%	6
	Above 50%	7
Organisational Performance	Significantly below average	1
	Quite below Average	2
	Slightly belowAverage	3
	Average	4
	Slightly above Average	5
	Quite above Average	6
	Significantly above average	7

4.3 Descriptive Statistics

Frequency distributions were gained for all demographic variables. Table 4.2 presents respondents' profile based on organisations' characteristics which consist of the type of ownership, type of industry, number of employees and experience of firms with E-HRM. Table 4.3 covers demographic profile based on the individuals that

include gender, age, education level, current job position and employment with the company (years of work experience).

Table 4.2: Demographics Profiles (Organisations)

Measure	Categories	Frequency	Percent	Cumulative Percent
Type of ownership	Government-linked company	5	3.62	3.62
	Local ownership	39	28.26	31.88
	Foreign ownership	82	59.42	91.3
	others	12	8.7	100
Type of Industry	Banking/finance	17	12.31	12.31
	Construction/Engineering	24	17.4	29.71
	Education	10	7.25	36.96
	Hospital	8	5.8	42.76
	Hotel	7	5.07	47.83
	Logistics	7	5.07	52.9
	Manufacturing	61	44.2	97.1
	Telecommunication	4	2.9	100
Number of employees	Less than 100	4	2.9	2.9
	100 – 499	22	15.94	18.84
	500 – 999	38	27.54	46.38
	More than 1000	74	53.62	100
Experience with E-HRM	3 Years	13	9.42	9.42
	4 Years	18	13.04	22.46
	5 Years	22	15.94	38.4
	6 Years	14	10.14	48.54
	7 Years	10	7.25	55.79
	8 Years	16	11.6	67.39
	9 Years	12	8.7	76.09
	10 Years	15	10.87	86.96
	More than 10 Years	18	13.04	100

Table 4.2 lists five government-linked companies (representing 3.62%), 39 local ownership organisations (28.26%), 82 foreign ownership organisations (59.42%) and 12 others type organisations (8.7%) used E-HRM. A total of 138 organisations' data was examined in this study. Among the organisations, the banking/finance industry accounts for 12.31%, construction/engineering industry accounts for 17.4%, and education and hospital industry account for 7.25% and 5.8% respectively. Moreover, the hotel, logistics, manufacturing and telecommunication industry account for 5.07%, 5.07%, 44.2% and 2.9% respectively.

Regarding the number of employees, 15.94% organisations have more than 100 employees but less than 100 employees. There are 27.54% organisations which have employees less than 1000 but more than 500. The employee group of 'more than 1000' was most in terms of proportion with 53.62% of the total respondents while the employee group of 'less than 100' was the least with 2.9%.

Looking at the number of E-HRM usage experience, the lowest number is found to be three years and the highest is more than 10 years. However, 38.4% of organisations were under five years of experience of E-HRM usage. Moreover, 23.91 % organisations had more than nine years of experience of E-HRM usage.

Table 4.3 presents the gender of the respondents consists of more male respondents (87.0%) as compared to female respondents (13.0%). In terms of age, more than two-thirds (66.07%) of the respondents were between 31-50 years old. The age group of 30-39 years old respondents was higher representing 38.45% of the total respondents. The age group of less than 30 years old was the least (13.72%). The statistics shows that one-fifth (20.21%) of the respondents is more than 50 years old.

Table 4.3: Demographics Profiles (Individual)

Measure	Categories	Frequency	Percent	Cumulative Percent
Gender	Male	482	87.00	87.00
	Female	72	13.00	100.00
Age	Less 30 years	76	13.72	13.72
	30-39 years	213	38.45	52.17
	40-50 years	153	27.62	79.79
	More than 50 years	112	20.21	100.00
Education level	Bachelor's degree	98	17.68	17.68
	Master's degree	444	80.14	97.82
	M.Phil./PhD. degree	12	2.18	100.00
Current position	First -line manager	271	48.92	48.92
	Mid-level Manager	188	33.93	82.85
	Top-level Manager	95	17.15	100.00
Employment with the company	3-5 years	189	34.12	34.12
	6-10 years	244	44.04	78.16
	More than 10 years	121	21.84	100.00

With respect to education level, more than three-quarters (82.32%) of the respondents had postgraduate degrees (Master's/MPhil/PhD), while only 17.68% of respondents had Bachelor degree. This indicates that the respondents were mostly highly educated which is a reflection of the positions held by them.

Again, respondents were asked to provide their present job position using a ratio scale. Employee job position was divided into three categories of HR managers: first–line manager, mid-level managers, and top-level managers. Top-level managers made up 17.15 % of the respondents. The largest proportion of the respondents (48.92%) hold positions as first-line managers. Among the respondents, 33.93% were mid-level managers. Overall, it can be concluded that the information gathered for this study came from representative sources.

The respondents' years of employment with their present company revealed that half (34.12%) of respondents had between less than 5-years and more than 2-year of job experience. About half proportion (44.04%) of respondents was under the category of 6-10 years of experience. Also, less than one-quarter (21.84%) of the respondents had more than 10 years of experience. In summary, more than two-thirds of the respondents (65.88%) had more than 6 years of experiences in their present company. 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.

4.4 Multivariate Assumptions

Meeting certain multivariate assumptions is critical for successful data analysis. These assumptions must be validated before the conclusion of any findings. Otherwise, even the significant coefficients may be inaccurate. This violation of assumptions can also give wrong predicting capacity of hypothesized relationship (Hair et al., 2010). After data were cleaned and errors corrected, the data were assessed for outliers linearity, homoscedasticity, multicollinearity, normality and common method bias. Hence, multivariate analysis requires above assumptions to be met.

4.4.1 Assessment of Data Normality

The normality in data is tested using the descriptive statistics (kurtosis and skewness). A simpler form of determining distribution can be done through visual examination of the histogram in Appendix B (Hair et al., 2010). However, testing for normality using histograms can sometimes be problematic (Hair et al., 2010). The skewness test of any dataset examines distribution's symmetry. The kurtosis test evaluates the clustering of scores toward the center of a distribution. The skewness value for measurement item ranges from -1.00 to .067, which is within the

recommended range of -1 to +1 (Hair et al., 2010). Kurtosis value for measurement item ranges from -1.162 to + 0.567 which is within the recommended range of -2 to +2 (Jarque & Bera, 1980). The test results indicate that data is in normal distribution.

The sample size of this study is 554 which is large enough to handle data requirement whereby sample size is greater than 200. This implies that the detrimental effect of non-normality cannot be more than negligible in this study (Hair et al., 2010).

4.4.2 Linearity

Testing for linearity was carried out on all the variables. Linearity was examined based on P-P plot (Appendix B). The linearity among the variables is determined by the closeness the plots are to the linear line (Hair et al., 2010). The theory of linearity expects that the assumptions on the randomness are not violated. This means, the points to be almost a straight line around the diagonal axis. In this study, the normal P-P plots seems that the assumption was not violated.

4.4.3 Homoscedasticity

The purpose of testing homoscedasticity is to test the assumption that the dependent variable exhibits equal levels of variance across the range of independent variables (Hair et al., 2010). This test is carried out to determine the level of departure from normality. The scatter plots (Appendix B) was used to check for homoscedasticity. Therefore, there is evidence of homoscedasticity which are obtained in the relationship between independent and dependent variables of this study. Graphical plots are attached in Appendix B.

4.4.4 Outliers

Outliers refer to the values that are substantially lower or higher than the other values in the data set (Pallant, 2011). Extreme outliers (points do not extend more than three

box-lengths from the edge of the box) can either overestimate or underestimate the true relationship. However, taking any action is not necessary for a few outliers in a large sample suggested by Dezdar (2011). Box plots was used to check for outliers (Appendix B). As observed, there was no outlier for human factor, technology factor, organisational factor and organisational performance. Nevertheless, there were three outliers for environmental factor and three outliers for E-HRM adoption. All these outliers did not extend more than three box-lengths from the edge of the box (Pallant, 2011). In other words, these were no extreme outliers.

4.4.5 Multicollinearity

Multicollinearity refers to the relationship of two or more independent variables which were very much correlated. A low multicollinearity results mean that independent variables are independent to each other. According to Pallant (2011), a high degree of multicollinearity is undesirable due to the fact that it increases the standard error of coefficients. Multicollinearity is determined by the level of variance inflating factor (VIF) and tolerance. Ideally, the level of VIF should be less than 10 while the level of tolerance should be greater than 0.1, in order to exhibit a lower level of multicollinearity (Malhotra, 2010). In this study, the results of the standard multiple regression pertaining to the multicollinearity issue as displayed in Table 4.4 indicates that all tolerance and VIF values have meet the cut-off values. The tolerance values for this study ranges from 0.359 to 0.659 and the VIF values ranges from 1.518 to 2.782. As such, all independent variables are independent to each other in this study.

Table 4.4: Multicollinearity Diagnostics

Constructs	Collinearity Statistics	
	Tolerance	VIF
Senior executives' characteristics	.428	2.336
IT expertise of HR personnel	.566	1.767
Relative advantage	.408	2.451
Perceived compatibility	.507	1.971
Perceived complexity	.659	1.518
Perceived cost	.627	1.594
Top management support	.554	1.806
Organisational culture	.447	2.238
Centralisation	.614	1.628
Competitive pressure	.599	1.668
Technology vendor support	.359	2.782

Dependent Variable: E-HRM Usage

In addition to this procedure, Pearson Correlation Coefficients were obtained to measure the strength of relationships between all the variables of this study. The recommended correlation coefficient value of r is less than 0.9 (Pallant, 2011). The correlation matrix between the measurement items was performed. Results from the correlation matrix reveal that all coefficients are positive and less than 0.9 (Table 4.5). So, this shows that the multicollinearity was not a primary concern in this study.

Table 4.5: Correlations for Study Variables

	SEC	TC	RA	COM	CX	PC	TM	OC	CEN	CP	VS	JS	EHR	OP
SEC	1													
TC	.536**	1												
RA	.583**	.436**	1											
COM	.404**	.340**	.500**	1										
CX	.426**	.406**	.478**	.362**	1									
PC	.608**	.480**	.510**	.326**	.454**	1								
TM	.547**	.397**	.413**	.270**	.290**	.524**	1							
OC	.518**	.486**	.600**	.470**	.341**	.423**	.451**	1						
CEN	.484**	.445**	.365**	.360**	.375**	.434**	.495**	.368**	1					
CP	.497**	.331**	.569**	.372**	.373**	.354**	.403**	.348**	.352**	1				
VS	.573**	.579**	.598**	.543**	.439**	.528**	.492**	.688**	.487**	.388**	1			
JS	.686**	.509**	.578**	.496**	.420**	.516**	.519**	.530**	.646**	.481**	.519**	1		
EHR	.753**	.649**	.541**	.429**	.410**	.631**	.614**	.621**	.539**	.371**	.654**	.702**	1	
OP	.540**	.407**	.527**	.420**	.380**	.573**	.626**	.512**	.575**	.491**	.542**	.693**	.648**	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

SEC : Senior executives' characteristics
TC : IT expertise of HR personnel
RA : Relative advantage
COM : Perceived compatibility
CX : Perceived complexity
PC : Perceived costs
TM : Top management support
OC : Organisational culture
CEN : Centralisation
CP : Competitive pressure
VS : Technology vendor support
JS : Job satisfaction of HR personnel
EHR : e-HRM usage
OP : Organisational performance

4.5 Common Method Bias

As with all self-reported data, there is a probability for common-method bias (Podsakoff & Organ, 1986). Several efforts have been conducted to reduce such bias during the instrument development stage. For instance, 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. According to Podsakoff, MacKenzie, Lee and Podsakoff (2003), Harman's one-factor or 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 in the research (Podsakoff et al., 2003). The results of this test for all constructs demonstrated one factor and no single factor emerged from the unrotated factor solution and accounted for the majority of the variance among variables. If any study has significant common method bias, a single factor will account for majority of the variance (usually more than 50%) in the model (Podsakoff et al., 2003). The first extracted factor accounted for 38.690 of the variance which is acceptable (see Appendix B for more details). It is therefore concluded that the data is free from common method bias.

4.6 Test of Non-Response Bias

According to Armstrong and Overton (1977), 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 utilised to assure the representativeness of the sample. Table 4.6 provides the results of the t-test. The group of 50 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 who 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 (Hair et al., 2010). Therefore, group two including 50 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 B).

Table 4.6: The Result of Differences (T-Test) of Early and Late Response on the Research Variables

Variables	Mean		t-value	Sig.
	Early response N=50	Late response N=50		
Senior executives' characteristics	4.9680	4.8920	.424	.673
IT expertise of HR personnel	5.5950	5.4400	.812	.419
Relative advantage	5.3886	5.4743	-.509	.612
Perceived compatibility	5.0160	5.1760	-.637	.526
Perceived complexity	4.6200	4.5700	.190	.850
Perceived cost	5.4550	5.5450	-.471	.639
Top management support	5.3280	5.2680	.376	.708
Organisational culture	5.0160	5.1760	-.637	.526
Centralisation	5.5750	5.6200	-.254	.800
Competitive pressure	5.5080	5.6280	-.723	.471
Technology vendor support	5.2240	5.2880	-.287	.775
E-HRM Usage	5.2800	5.2314	.216	.829
Organisational Performance	5.4833	5.4900	-.039	.969
Job Satisfaction of HR Personnel	5.4100	5.2350	.858	.393

4.7 Scale Purification

Following the procedure of Churchill Jr (1979), the purity of the scales was used in this study to assess item-total-correlation and Cronbach's alpha. This method has been used in the past to purify the scales e.g. Naqshbandi (2013). The conventional cut-off point of 0.5 is used and the items with item-total-correlation below this cut-off point are considered weak and thus dropped. In this study, no item was found to have item-total-correlation below the cut-off point of 0.5. The results of scale purification are shown below in Table 4.7. Moreover, an EFA was conducted on the independent variables for items re-confirmation. This is explained in the next section. Furthermore, Table 4.7 shows the Cronbach's alpha for all the sub-scales was well above the satisfactory point of 0.7 which confirm reliability of the scales (Hair et al., 2010). For additional understanding on data reliability, please refer to Appendix B.

Table 4.7: Item-total-correlation and Cronbach's Alpha for all Items

Items	Mean	SD	Item-total-Correlation	Cronbach's Alpha
SE1	5.20	1.091	0.784	0.898
SE2	5.27	1.135	0.795	
SE3	5.13	1.161	0.811	
SE4	5.18	1.167	0.792	
SE5	4.66	.934	0.559	
EC1	5.63	1.114	0.750	0.907
EC2	5.56	1.237	0.816	
EC3	5.59	1.180	0.809	
EC4	5.62	1.116	0.785	
RA1	5.68	1.090	0.717	0.894
RA2	5.64	1.068	0.733	
RA3	5.58	1.042	0.734	
RA4	5.51	1.003	0.667	
RA5	5.71	1.000	0.627	
RA6	5.71	1.053	0.690	
RA7	5.61	1.012	0.676	
CO1	5.32	1.290	0.795	0.916
CO2	5.33	1.285	0.814	
CO3	5.33	1.252	0.784	
CO4	5.42	1.256	0.776	
CO5	5.31	1.261	0.749	

Table 4.7 Continued: Item-total-correlation and Cronbach's Alpha for all Items

Items	Mean	SD	Item-total-Correlation	Cronbach's Alpha
CX1	4.96	1.191	0.780	0.905
CX2	4.78	1.544	0.826	
CX3	4.80	1.509	0.818	
CX4	5.05	1.378	0.746	
PC1	5.73	1.064	0.739	0.879
PC2	5.72	1.149	0.806	
PC3	5.56	1.130	0.752	
PC4	5.90	.878	0.676	
TM1	5.45	1.039	0.646	0.845
TM2	5.42	1.035	0.644	
TM3	5.39	1.057	0.645	
TM4	5.42	.995	0.637	
TM5	5.38	1.096	0.691	
OC1	5.42	1.336	0.839	0.917
OC2	5.47	1.334	0.821	
OC3	5.47	1.343	0.876	
OC4	5.49	1.327	0.818	
OC5	4.53	1.107	0.583	
CE1	5.78	1.112	0.698	0.867
CE2	5.73	1.135	0.718	
CE3	5.74	1.111	0.744	
CE4	5.76	1.144	0.707	
CP1	5.57	.962	0.704	0.868
CP2	5.81	1.056	0.667	
CP3	5.56	1.007	0.721	
CP4	5.69	1.007	0.666	
CP5	5.77	.996	0.694	
VS1	5.41	1.256	0.727	0.884
VS2	5.47	1.279	0.740	
VS3	5.54	1.125	0.733	
VS4	5.42	1.187	0.705	
VS5	5.26	1.167	0.698	
AP1	5.30	1.362	0.799	0.941
AP2	5.34	1.219	0.792	
AP3	5.24	1.473	0.825	
AP4	5.24	1.295	0.802	
AP5	5.25	1.474	0.787	
AP6	5.27	1.218	0.797	
AP7	5.12	1.336	0.845	
OP1	5.71	.991	0.710	0.897
OP2	5.62	1.054	0.717	
OP3	5.73	1.008	0.720	
OP4	5.69	1.091	0.742	
OP5	5.67	.902	0.746	
OP6	5.77	1.056	0.702	
JS1	5.57	1.169	0.781	0.913
JS2	5.44	1.187	0.819	
JS3	5.43	1.155	0.832	
JS4	5.50	1.146	0.775	

4.8 Exploratory Factor Analysis (EFA)

In this study, EFA was performed on 11 independent variables and one moderating variable. Some of independent variables such as IT expertise of HR personnel, perceived compatibility, perceived costs, organisational culture, competitive pressure and technology vendor support include two instruments of different authors. Moreover, these instruments were used at different settings but related to IS research. Besides, the mediating variable (Job satisfaction of HR personnel) is also slightly a modified instrument. So, EFA is used to establish dimensionality and convergent validity of the relationship between items and constructs. Besides, factor analysis was not used for organisational performance variable (dependent variable) due to the fact that there is an obvious distinction which performance is either nonfinancial or financial measures. This method has been used in the past organisational performance research (Asiaei, 2014). Similarly, EFA was not performed for the intervening variable - E-HRM usage due to obvious distinction among the items (HR functions). In this study, principal component analysis (PCA) was employed as an extraction method. Varimax with Kaiser normalisation was also used for rotation method and accepted factor loading value for each item was 0.5 as suggested by Hair et al. (2010).

4.8.1 Exploratory Factor Analysis of Independent Variables

EFA was conducted on all the independent variables of this study. The results specify that the Barlett test of sphericity (Bartlett, 1954) met statistical significance (Chi-Square = 20499.124, $p<.01$) and the Kaiser-Meyer-Oklin (KMO) measure of sampling adequacy was 0.958, greater than the recommended value of .60 (Kaiser, 1974). After running the factor analysis, eleven components factors were extracted with eigen value of greater than 1. Table 4.8 demonstrations the results of factor analysis of independent constructs. Also, the original principal component analyses with varimax rotation are presented in Appendix C.

Table 4.8: EFA of Independent Variables

Items	Factors										
	1	2	3	4	5	6	7	8	9	10	11
RA3	0.735										
RA7	0.715										
RA1	0.692										
RA6	0.621										
RA4	0.619										
RA2	0.606										
RA5	0.584										
CO5		0.763									
CO1		0.763									
CO3		0.760									
CO2		0.753									
CO4		0.752									
OC3			0.776								
OC5			0.757								
OC4			0.728								
OC2			0.720								
OC1			0.714								
CP3				0.790							
CP5				0.741							
CP2				0.740							
CP1				0.727							
CP4				0.694							
TM3					0.720						
TM1					0.715						
TM4					0.710						
TM5					0.691						
TM2					0.684						
EC2						0.801					
EC3						0.795					
EC1						0.770					
EC4						0.758					
CX2							0.861				
CX1							0.845				
CX3							0.779				
CX4							0.739				
PC2								0.821			
PC1								0.779			
PC4								0.766			
PC3								0.755			
CE4									0.768		
CE2									0.767		
CE1									0.757		
CE3									0.732		

Table 4.8 continued: Exploratory Factor Analysis of independent variables

Items	Factors										
	1	2	3	4	5	6	7	8	9	10	11
SE1										0.746	
SE3										0.692	
SE2										0.679	
SE4										0.661	
SE5										0.553	
VS5											0.730
VS3											0.634
VS4											0.612
VS2											0.601
VS1											0.529
% of variance	36.177	5.844	5.254	4.530	4.151	3.413	3.115	2.625	2.491	2.143	1.957
Eigen value	19.174	3.097	2.785	2.401	2.200	1.809	1.651	1.391	1.320	1.136	1.037
Total variance extracted by 11 factors = 71.70%.											

4.8.2 Exploratory Factor Analysis of Mediating Variable

Job satisfaction of HR personnel is assumed as a moderating variable in this study. Exploratory factor analysis was conducted on this mediating variable. The factor loading matrix presented in Table 4.9 below shows that with eigen value of more than 1, one factor emerges. This single factor explains 79.34% of the variance. The results specify the Barlett test of sphericity (Bartlett, 1954) met statistical significance (Chi-Square = 1513.622, $p<.01$) and the KMO measure of sampling adequacy was 0.854, greater than the recommended value of 0.60 (Kaiser, 1974). Besides, the original principal component analyses with varimax rotation are presented in Appendix C.

Table 4.9: Exploratory Factor Analysis of Mediating Variable

Items	Communalities Extraction	Factor 1
JS3	0.769	0.910
JS2	0.813	0.902
JS1	0.828	0.877
JS4	0.763	0.874
% of variance	79.34	
Eigen value	3.179	

4.9 Structural Equation Modelling and Confirmatory Factor Analysis (CFA)

SEM has to components: measurement model analysis and structured model analysis. The details procedures of SEM analysis was discussed in earlier chapter 3, section 3.12.2. Here, CFA was conducted to evaluate and validate the measurement models. A measurement model is the linkage between factors and their measured variables; thus it defines associations between the observed and the unobserved variables (Byrne, 2010). The validity of the measurement models can be tested in two ways: one, evaluating each construct separately, that is having only one construct in the measurement model; two, testing all the constructs together at a time in one measurement model (Cheng, 2001). While researchers (e.g., Naqshbandi, 2013; Woo, Trail, Kwon & Anderson, 2009) have preferred testing all constructs at once to testing each construct separately as the former allows taking into account the relationships between the items of different constructs - in this study, the researcher takes a more rigorous approach by choosing both methods.

The factor structure which was explored by the EFA in earlier section is confirmed by the CFA. Thus, guided by the results of EFA, in Approach I, each construct has its own measurement model: that is, eleven independent variables, one intervening variable, one mediating variable and one dependent variable. In Approach II, all the constructs were assessed in a single measurement model. As mentioned earlier, Hair et al. (2010) suggested using at least three to four fit indexes to evaluate model fit. Among these, current study used the CMIN/DF (ratio of Chi-square- $\chi 2$ values and degrees of freedom-df), the CFI and the RMSEA to evaluate the measurement models. Hair et al. (2010) suggested at least one incremental index, one absolute index, and CMIN/DF for reporting the goodness-of-fit indexes.

Approach I: Assessing Individual Measurement Models

Some initial measurement models show a satisfactory level of goodness-of-fit indexes and vice versa. Hair et al. (2010) recommended that applying trial and error methods with reference to the modification indexes until the modification indexes reach a satisfactory level of goodness-of-fit for the individual measurement model to be acceptable. In this study, AMOS version 20 software package was used to suggest possible ways of improving model fit providing a modification index. The results of all measurement models have been summarised in Table 4.10.

Table 4.10: Model Fit Indexes for Constructs

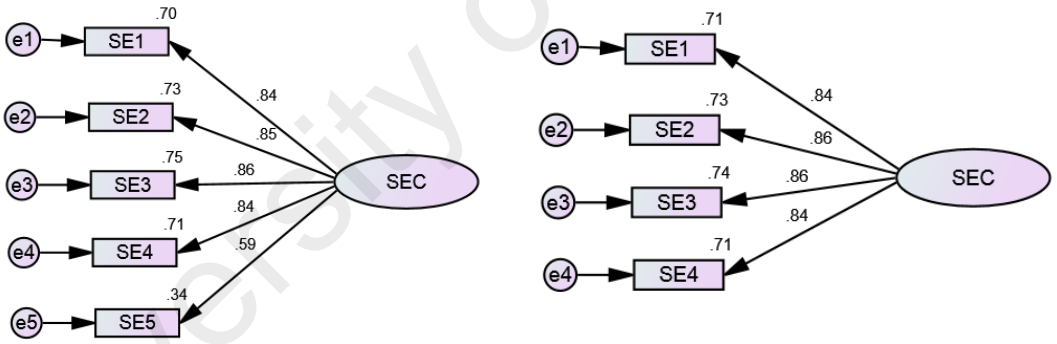
Constructs	Items	Initial Model Fit	Final Model Fit
Senior executives' characteristics	SE1 SE2 SE3 SE4 SE5*	CFI = 1.000 RMSEA = 0.09 CMIN/DF = 1.058	CFI = 0.999 RMSEA = 0.027 CMIN/DF = 1.417
IT expertise of HR personnel	EC1 EC2 EC3 EC4	CFI= 1.00 RMSEA = 0.00 CMIN/DF= 0.086	Unchanged
Relative Advantage	RA1* RA2 RA3 RA4 RA5 RA6 RA7	CFI= 0.977 RMSEA = 0.074 CMIN/DF= 4.014	CFI= 0.997 RMSEA = 0.028 CMIN/DF= 1.448
Perceived compatibility	CO1 CO2 CO3 CO4 CO5	CFI = 0.997 RMSEA = 0.043 CMIN/DF = 2.03	Unchanged
Perceived complexity	CX1 CX2 CX3 CX4	CFI = 1.00 RMSEA = 0.002 CMIN/DF = 1.001	Unchanged
Perceived Cost	PC1 PC2 PC3 PC4	CFI = 0.998 RMSEA = 0.05 CMIN/DF = 2.38	Unchanged

Table 4.10 continued: Model Fit Indexes for Constructs

Constructs	Items	Initial Model Fit	Final Model Fit
Top Management Support	TM1 TM2 TM3 TM4 TM5*	CFI = 1.00 RMSEA = 0.084 CMIN/DF = 3.674	CFI = 0.999 RMSEA = 0.023 CMIN/DF = 1.301
Organisational culture	OC1 OC2 OC3 OC4 OC5	CFI = 0.999 RMSEA = 0.039 CMIN/DF = 1.851	Unchanged
Centralisation	CE1 CE2 CE3 CE4	CFI = 0.997 RMSEA = 0.057 CMIN/DF = 2.783	Unchanged
Competitive Pressure	CP1* CP2 CP3 CP4 CP5	CFI= 1.00 RMSEA = 0.112 CMIN/DF= 1.812	CFI= 0.999 RMSEA = 0.023 CMIN/DF= 1.298
Technology Vendor Support	VS1* VS2 VS3 VS4 VS5	CFI = 1.00 RMSEA =0.049 CMIN/DF = 3.08	CFI = 0.998 RMSEA = 0.036 CMIN/DF = 1.723
E-HRM Usage	AP1 AP2 AP3 AP4 AP5 AP6 AP7	CFI= 0.997 RMSEA = 0.036 CMIN/DF= 1.716	Unchanged
Organisational Performance	OP1 OP2 OP3 OP4 OP5 OP6	CFI = 0.984 RMSEA = 0.075 CMIN/DF = 4.084	CFI = 0.995 RMSEA = 0.047 CMIN/DF = 2.203
Job Satisfaction of HR Personnel	JS1 JS2 JS3 JS4	CFI = 1.000 RMSEA = 0.000 CMIN/DF = 0.031	Unchanged

4.9.1 Senior Executives' Characteristics Subscale

The initial model fit indexes for 'senior executives' characteristics show reasonable fit. Figure 4.1(a) presents the measurement model and reports the goodness-of-fit measures. Here, all five items were significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2010). The initial model fit indexes for senior executives' characteristics expressed unsatisfactory model fit with RMSEA = 0.09. So, model modification was required to attain a perfect fit. The concept of item SE5 (*they usually have fresh perspectives on old problems*) was dropped because the concept was already covered in SE1 (*senior executives have original ideas*) and also SE2 (*they would sooner make something new than advance something existing*). This method was used by Dezdar (2011). Finally, the new model fit indexes are improved significantly to CMIN/DF = 1.417, CFI = 0.999, and RMSEA = 0.027.



(a) (b)

Figure 4.1: Initial (a) and Final (b) Measurement Model of Senior Executives' Characteristics Construct

4.9.2 IT Expertise of HR Personnel Subscale

Further, the primary model fit indexes for IT expertise of HR personnel show reasonable fit. Figure 4.2 presented the construct measurement model and reports the goodness-of-fit measures. All four items had significant factor loading ($p<0.001$) and considered satisfactory with value of 0.5 and above (Hair et al., 2006). As a result, the

measure displays as, CFI= 1.00, RMSEA = 0.00 and CMIN/DF= 0.086; that are indicative to adequate fit between the hypothesised model of IT expertise of HR personnel and the sample data (Byrne, 2010).

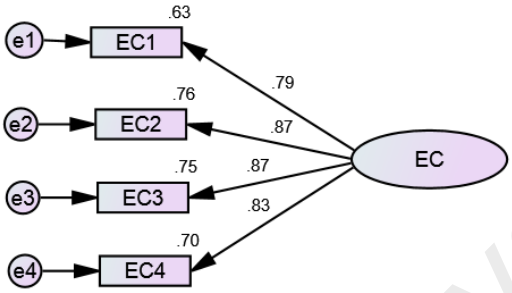
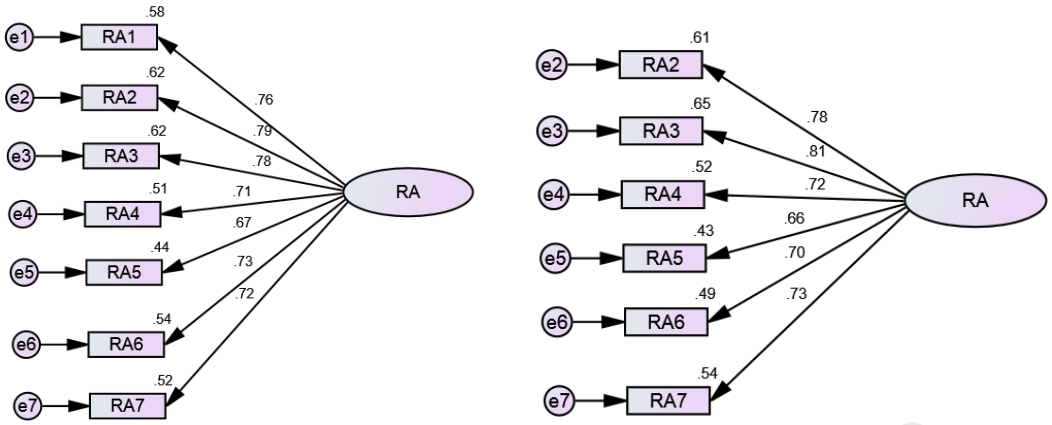


Figure 4.2: Measurement Model of IT Expertise of HR Personnel Construct

4.9.3 Relative Advantage Subscale

Figure 4.3(a) presents the primary relative advantage construct measurement model and reports the goodness-of-fit measures. Here, all seven items had significant factor loading ($p<0.001$) and considered satisfactory with value of 0.5 and above (Hair et al., 2006). Nevertheless, CMIN/DF value of 4.014 shows unsatisfactory of goodness-of-fit index. So, model modification was conducted to attain a perfect fit. The concept of item RA1 (*E-HRM improves the quality of HR personnel's work*) was dropped because this concept is already covered in RA2 (*It boosts our effectiveness on the job*) and RA3 (*It does not enable HR personnel to finish tasks quickly*). Based on modification indexes, Figure 4.3 (b) represents that the new model fit indexes have improved significantly (CFI = 0.997, RMSEA = 0.028, and CMIN/DF = 1.448).



(a) (b)

Figure 4.3: Initial (a) and Final (b) Measurement Model of Relative Advantage Construct

4.9.4 Perceived Compatibility Subscale

The model fit indexes for 'perceived compatibility' show reasonable fit. Figure 4.4 presents the construct measurement model and reports the goodness-of-fit measures. All five items had significant factor loading ($p<0.001$) and measured satisfactory with value of 0.5 and above (Hair et al., 2006). Moreover, the measure displays (CFI= 0.997, RMSEA = 0.043, and CMIN/DF= 2.03) satisfactory level of goodness-of-fit indexes (Hair et al., 2006).

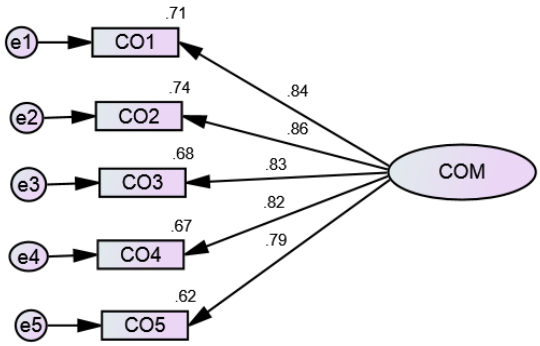


Figure 4.4: Measurement Model of Perceived Compatibility Construct

4.9.5 Perceived Complexity Subscale

The model fit indexes for 'perceived complexity' demonstrate reasonable fit. Figure 4.5 presents the construct measurement model and reports the goodness-of-fit measures.

Moreover, all four items had significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2006). The measure (CFI= 1.00, RMSEA = 0.002 and CMIN/DF= 1.001) also reports a satisfactory level of goodness-of-fit indexes (Hair et al., 2006).

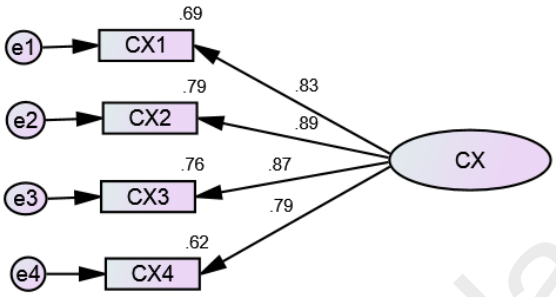


Figure 4.5: Measurement Model of Perceived Complexity Construct

4.9.6 Perceived Cost Subscale

Figure 4.6 represents the initial model fit index for the measurement model of perceived cost construct. The model fit indexes demonstrate reasonable fit: CFI= 0.998; RMSEA = 0.05 CMIN/DF= 2.38; (Hair et al., 2006). Moreover, all four items had significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2006). So, there is no need for any modification in this measurement model.

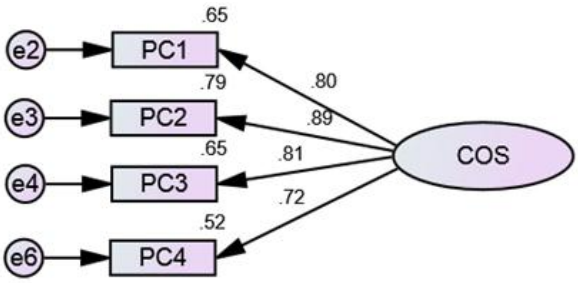
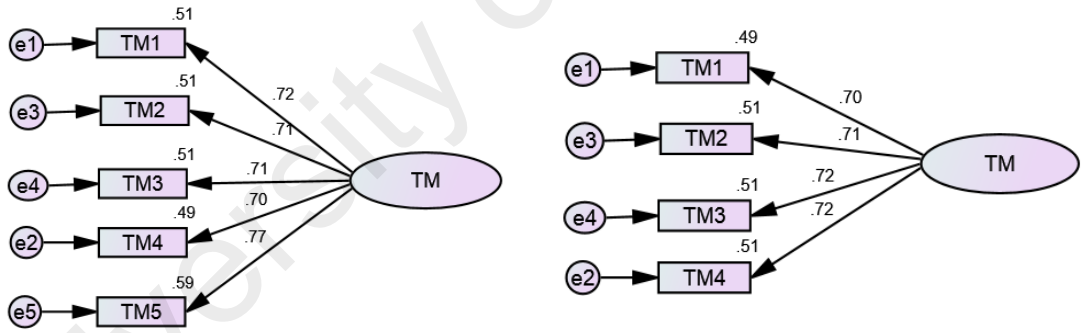


Figure 4.6: Measurement Model of Perceived Cost Construct

4.9.7 Top Management Support Subscale

Figure 4.7 demonstrates the primary model fit indexes for 'top management support', and it shows unsatisfactory of goodness-of-fit indexes: RMSEA = 0.084 and CMIN/DF = 3.674. Therefore, further model modification was conducted to achieve a perfect fit. However, all four items had significant factor loading (p<0.001) and were considered satisfactory with value of 0.5 and above. Based on the modification indexes, item TM5 (*Top management actively participates in establishing a vision and formulating strategies for operating E-HRM modules*) is dropped because the concept is already covered in TM1 (*Top management willingly supports the adoption/usage of E-HRM modules*). The new model fit indexes are enhanced notably to CFI = 0.999, RMSEA = 0.023, and CMIN/DF = 1.301.



(a) (b)

Figure 4.7: Initial (a) and Final (b) Measurement Model of Top Management Support Construct

4.9.8 Organisational Culture Subscale

The model fit indexes for 'organisational culture' show reasonable fit. Figure 4.8 presents the construct measurement model and reports the goodness-of-fit measures. Moreover, all five items had significant factor loading (p<0.001) and were considered

satisfactory with value of 0.5 and above (Hair et al., 2006). Moreover, the measure displays as CFI= 0.999, RMSEA = 0.039, and CMIN/DF= 1.851; that show satisfactory level of goodness-of-fit indexes for the measurement model.

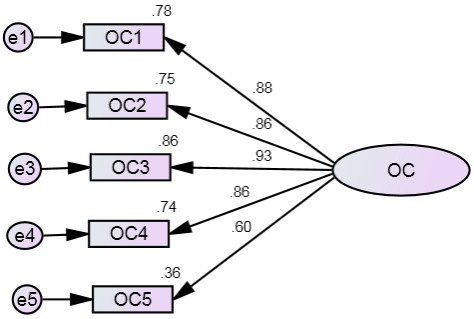


Figure 4.8: Measurement Model of Organisational Culture Construct

4.9.9 Centralisation Subscale

Figure 4.9 represents the initial model fit index for the measurement model of centralisation construct. The model fit indexes demonstrate reasonable fit: CFI= 0.997, RMSEA = 0.057 and CMIN/DF= 2.783 (Hair et al., 2006). Moreover, all four items had significant factor loading ($p<0.001$) and were considered satisfactory with value of .05 and above (Hair et al., 2006). So, there is no need for any modification in this measurement model.

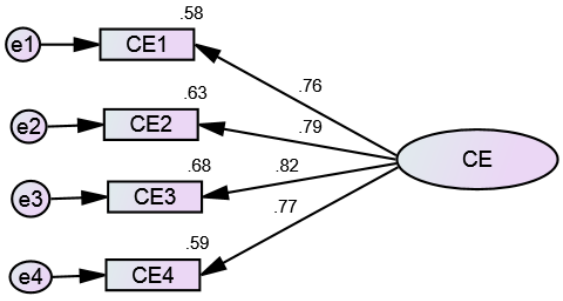


Figure 4.9: Measurement Model of Centralisation Construct

4.9.10 Competitive Pressure Subscale

The primary model fit indexes (Figure 4.10 a) for 'competitive pressure' show all five items had significant factor loading ($p<0.001$) and were considered satisfactory with a value above 0.5 (Hair et al., 2006). But, the primary model showed unreasonable fit in the items RMSEA = 0.112. So, model modification was conducted to attain a perfect fit. The concept of item CP1 (*Competition is a factor in organisation's decision to adopt E-HRM technology*) is dropped because the concept is already covered in CP2 (*The overall HRM practices pressure us to adopt E-HRM technology*) and also CP3 (*Our competitors are pressuring us to use E-HRM modules*). So, the new model fit indexes improved significantly to CFI= 0.999, RMSEA = 0.023, and CMIN/DF= 1.298 (Figure 4.10 b).

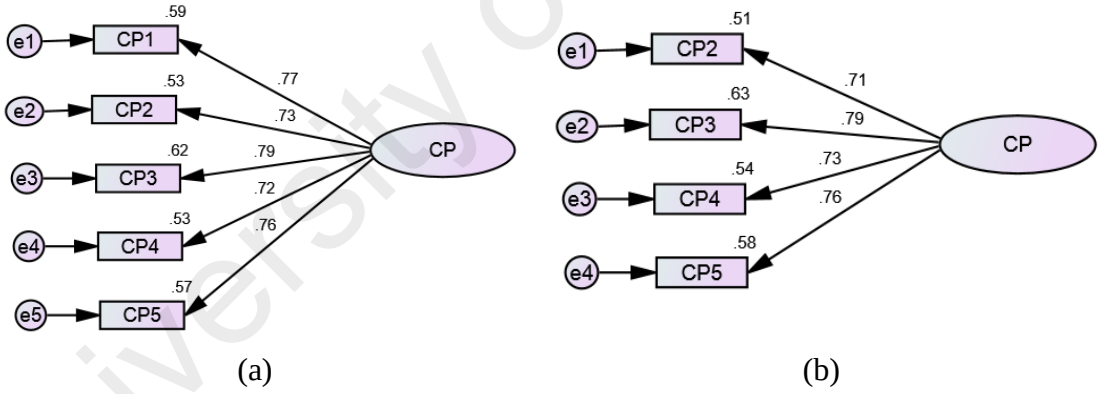
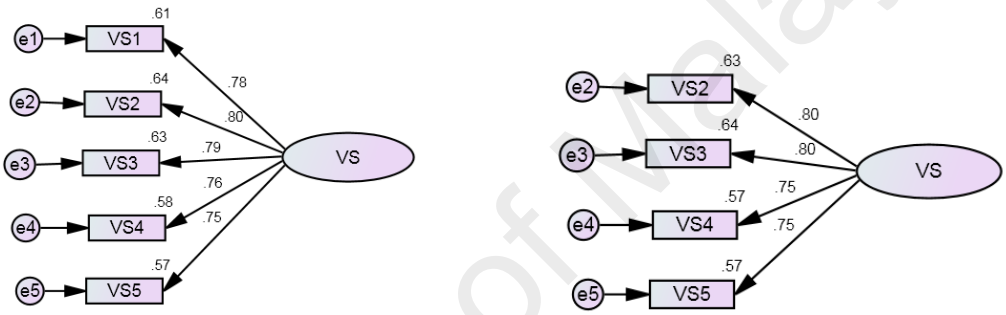


Figure 4.10: Initial (a) and Final (b) Measurement Model of Competitive Pressure Construct

4.9.11 Technology Vendor Support Subscale

Figure 5.13 (a) shows that all items had significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2006). Nevertheless, the CMIN/DF value is 3.08, and that is more than the recommended value of 3.00 suggested for goodness-of-fit measures (Hair et al., 2006). So, model modification was

conducted to attain a perfect fit. The concept of item VS1 (*Availability of solutions for information system related problems motivate us to adopt E-HRM modules*) was dropped because the concept was already covered in VS4 (*Technology vendor provides adequate technical support during E-HRM implementation*.) and also VS5 (*Technology vendor does not provide adequate technical support after E-HRM implementation*). The measure displays as, CFI value of 0.998, RMSEA value of 0.036, and CMIN/DF of 1.723; that shows satisfactory level of goodness-of-fit indexes for the measurement model (Figure 5.13b).



(a) (b)

Figure 4.11: Initial (a) and Final (b) Measurement Model of Competitive Pressure Construct

4.9.12 E-HRM Usage Subscale

The model fit indexes for E-HRM usage (intervening variable) show reasonable fit. Figure 4.12 presents the construct measurement model and reports the goodness-of-fit measures. Moreover, all seven items had significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2010). Moreover, the measure displays as, CFI= 0.997 and RMSEA = 0.036, and CMIN/DF= 1.716; that show satisfactory level of goodness-of-fit indexes for the measurement model.

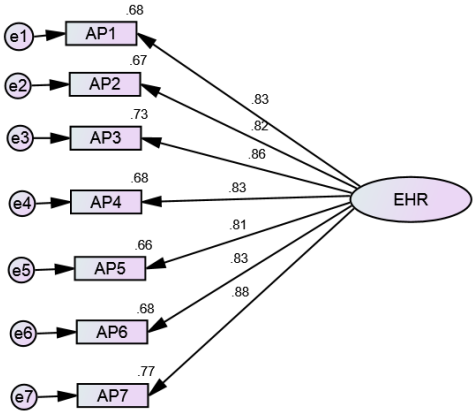


Figure 4.12: Measurement Model of E-HRM Usage Construct

4.9.13 Job Satisfaction of HR Personnel Subscale

Figure 4.13 represents the initial model fit index for the measurement model of centralisation construct. The model fit indexes demonstrate reasonable fit: CFI= 1.00, RMSEA = 0.000 and CMIN/DF= 0.031 (Hair et al., 2006). Moreover, all four items had significant factor loading ($p<0.001$) and were considered satisfactory with value of 0.5 and above (Hair et al., 2006). So, there is no need for any modification in this measurement model.

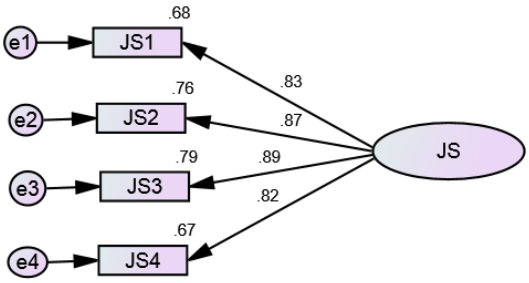
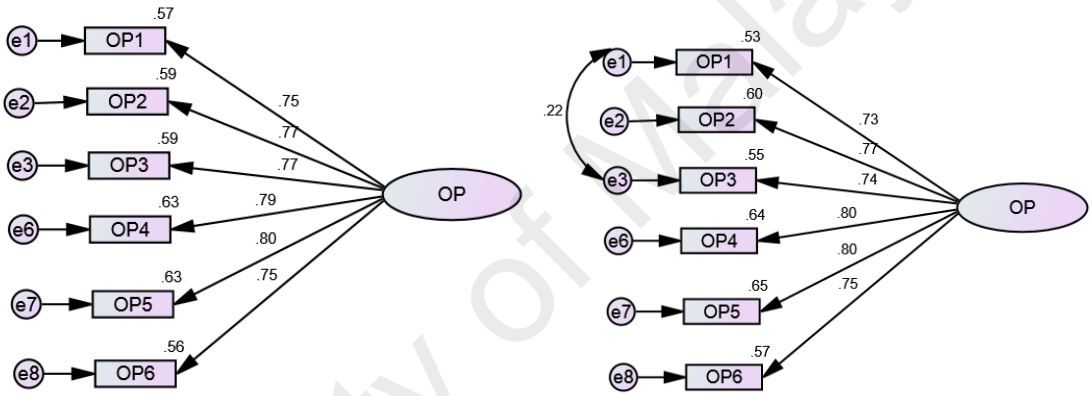


Figure 4.13: Measurement Model of Job Satisfaction of HR Personnel Construct

4.9.14 Organisational Performance Subscale

The initial model fit indexes for the dependent variable - Organisational Performance - demonstrates that all seven items had significant factor loading ($p<0.001$) and were considered satisfactory with a value above 0.5 (Hair et al., 2006). But, the initial model

(Figure 4.14 a) showed unreasonable fit in the item CMIN/DF = 4.048. So, model modification was conducted to attain a perfect fit. The model was then respecified to accommodate co-vary within the construct errors. Due to the lack of fit, Modification Indexes (MI) and the standardised residuals were observed by AMOS output to guide the model specification (Byrne, 2010). The measure displays as, CFI value of 0.995, RMSEA value of 0.047, and CMIN/DF of 2.203. Figure 4.14 (b) shows the final measurement model of organisational performance, and reports the goodness-of-fit measures.



(a) (b)

Figure 4.14: Initial (a) and Final (b) Measurement Model of Organisational Performance Construct

Approach II: Assessing the Measurement Model with all Variables

Woo et al. (2009) suggested testing of all constructs at once as this approach allows taking into account the relationships between the items of different constructs. Consequently, all the fourteen constructs of this study, including eleven independent variables, one intervening variable, one mediating variable, and one dependent variable are evaluated in one measurement model. Resultantly, the measure displays as, the CFI value of 0.953, the RMSEA value of 0.034, and the CMIN/DF of 1.644; that shows satisfactory level of goodness-of-fit indexes proposed by Hair et al. (2010) for the

measurement model with all fourteen construct (Figure 4.15). The summary details of this measurement model put together and the model fit indexes are shown below in Table 4.11. In addition, the details statistical representations of the initial and the final measurement models are provided in Appendix C.

Table 4.11: Result of Confirmatory Factor Analysis

	Observed Value	Acceptable Fit Standard
Statistical Test		
CMIN (Chi-Square)	3161.639	
DF	1923	
CMIN/DF	1.644	Less than 3 and $p < 0.01$
Fit Indexes		
CFI	0.953	0.90 or larger
RMSEA	0.034	Less than 0.08

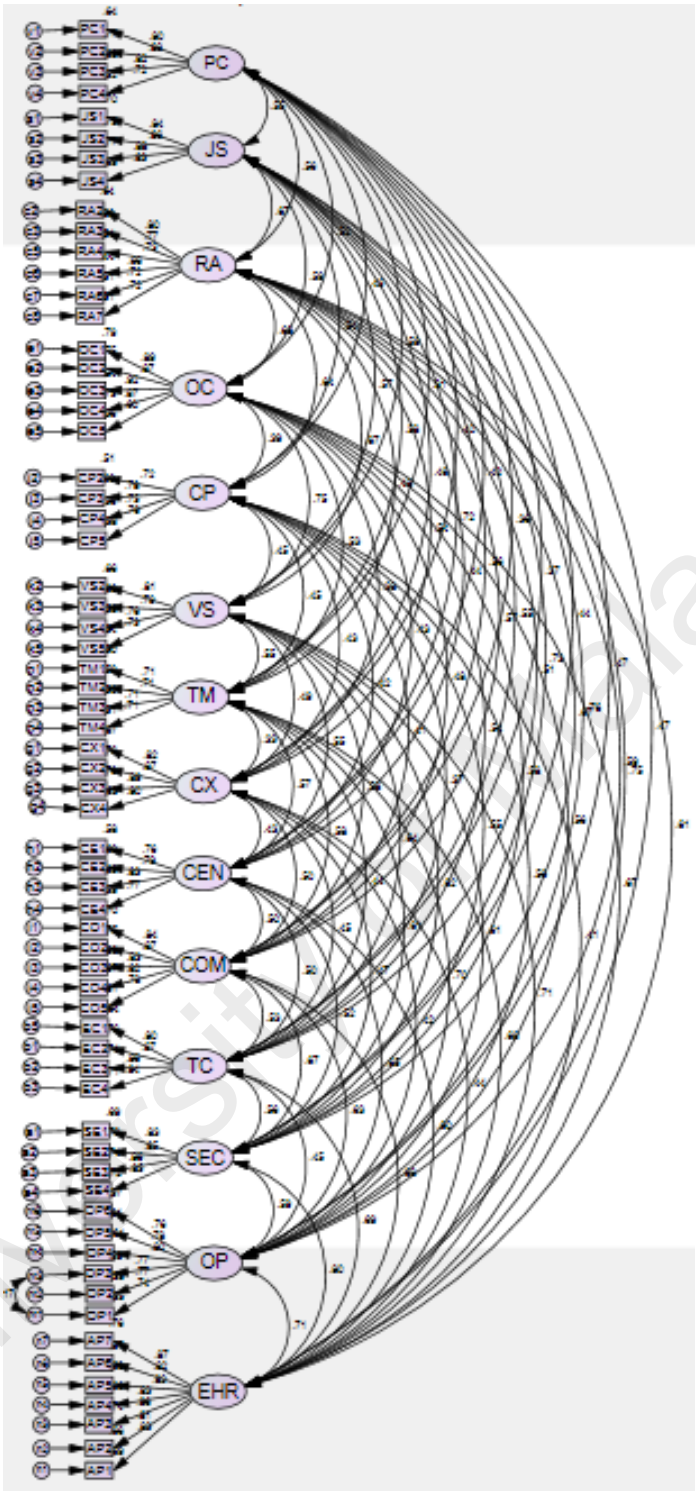


Figure 4.15: Measurement Model with all Variables

4.10 Construct Validity

The construct validity was examined based on the measurement model (Figure 4.15) which includes 14 constructs. Schumacker and Lomax (2004) stated that validating the measurement model is enough to address any issue of construct validity. Discriminant

and convergent validity are two methods of the most widely accepted forms of the construct validity. Byrne (2010) states that for proper inferences to be drawn based on the data, the data needs to exhibit evidence of discriminant and convergent validity. For additional statistical outputs, please refer to Appendix C.

4.10.1 Discriminant Validity

Discriminant validity can be assessed with the help of AMOS™ and a Microsoft® Excel™ Macro. To assess discriminant validity, Average Variance Extracted (AVE), Average Shared Squared Variance (ASV) and Maximum Shared Squared Variance (MSV) were calculated. For checking discriminant validity, Hair et al. (2010) suggested below conditions: a) the values MSV < the values AVE, and b) the values ASV < the values AVE.

In this study, a macro developed by *kolobkreations.com* was used to calculate MSV, ASV and AVE. This Microsoft® Excel™ macro calculates these statistics based on standardised regression weights and correlation tables of the measurement model which is obtained in AMOS™. The macro can be obtained from: *http://statwiki.kolobkreations.com/*. The results obtained after using this macro are displayed below in Table 4.12.

As can be seen in Table 4.12, the MSV values and the ASV values for all the dimensions of the constructs of this study is less than the AVE values. The fulfilment of two conditions ensures enough evidence that all the 14 constructs are distinct. So, it can be concluded that discriminant validity is established in this study.

Table 4.12: Discriminant Validity Test

Construct	AVE	MSV	ASV
1. Senior executives' characteristics	0.721	0.640	0.369
2. IT expertise of HR personnel	0.710	0.483	0.267
3. Relative advantage	0.540	0.461	0.349
4. Perceived compatibility	0.685	0.466	0.303
5. Perceived complexity	0.712	0.294	0.198
6. Perceived cost	0.652	0.349	0.210
7. Top management support	0.506	0.494	0.289
8. Organisational culture	0.698	0.561	0.310
9. Centralisation	0.619	0.524	0.277
10. Competitive pressure	0.563	0.413	0.223
11. Technology vendor support	0.601	0.561	0.365
12. E-HRM Usage	0.698	0.640	0.413
13. Job Satisfaction of HR Personnel	0.726	0.579	0.390
14. Organisational Performance	0.591	0.579	0.362

4.10.2 Convergent Validity

Convergent validity of the constructs of this study can be assessed with the help of AMOS™ and Microsoft® Excel™ macro that was used to assess discriminant validity as well. To assess convergent validity, Average Variance Extracted (AVE) and Composite Reliability (CR) were calculated. According to Hair et al. (2010), for convergent validity to be present: a) the values CR > the values AVE, and b) the values AVE > 0.5.

In this study, as mentioned above, the macro developed by *kolobkreations.com* was used to calculate the CR and the AVE. This Microsoft® Excel™ macro calculates these statistics based on standardised regression weights and correlation tables of the measurement model as obtained in AMOS™. The results obtained after using this macro are displayed below in Table 4.13.

Table 4.13: Convergent Validity Test

Construct	CR	AVE
1. Senior executives' characteristics	0.912	0.721
2. IT expertise of HR personnel	0.907	0.710
3. Relative advantage	0.875	0.540
4. Perceived compatibility	0.916	0.685
5. Perceived complexity	0.908	0.712
6. Perceived cost	0.882	0.652
7. Top management support	0.804	0.506
8. Centralisation	0.866	0.619
9. Organisational culture	0.919	0.698
10. Competitive pressure	0.838	0.563
11. Technology vendor support	0.858	0.601
12. E-HRM Usage	0.942	0.698
13. Job satisfaction of HR personnel	0.914	0.726
14. Organisational performance	0.897	0.591

As it can be seen in Table 4.13 above, the CR values for all 14 constructs of this study are greater than the AVE values. Besides, the AVE values for all 14 constructs are greater than 0.5. Hence, the fulfilment of two conditions ensures enough evidence that all 14 constructs show convergent validity.

In addition to this, the CR values of all 14 constructs of this study are greater than 0.7 while factor loadings of all the items are above the cut-off point of 0.5 (Hair et al., 2010). This provides enough evidence of uni-dimensionality and reliability of the constructs of the present study (Hair et al., 2010). So, it can be concluded that convergent validity is established in this study.

4.11 Full Structural Model

SEM in essence is a combination of factor analysis and multiple regression. The model based on multiple regression is called the structural model, while the model based on (confirmatory) factor analysis is called the measurement model. Structural model provides essential results to testing the hypotheses.

This study includes three structural models. The model fit indexes from the structural model 1 which is reported in Table 4.14. The structural model 1 (Figure 4.16) examines the relationship between all the variables except moderating – business experience with E-HRM and mediating variable– Job satisfaction of HR personnel.

Based on SEM fit indexes, the results indicate that the value of proposed structural model of 1 presents an acceptable fit. The CFI was 0.945 that was greater than the recommended level of 0.90, and the RMSEA was 0.038 that was lower than the accepted cut off value of 0.08. Besides, the value of CMIN/DF was 1.781 that was also lower than the accepted cut off value of less than 3. Overall, the structural model 1 reports a satisfactory level of the goodness-of-fit measures. Moreover, the standardised loadings were greater than 0.5 with significant corresponding t-values for all constructs. The complete result of the structural model 1 is enclosed in Appendix C.

Table 4.14 summarises the output for the structural model including the estimates (β), standard errors (s.e.) and p-values. The Table 4.14 shows that there was a significant relationship between senior executives' characteristics and E-HRM usage. The $\beta = 0.403$ (s.e. = 0.045) and p-value = 0.000 with less than 0.001. Similarly, a significant relationship between IT expertise of HR personnel and E-HRM usage was observed with $\beta = 0.225$ (s.e. = 0.037) and p-value = 0.000 which was less than 0.001. A significant relationship was observered between perceived compatibility and E-HRM usage with $\beta = 0.099$ (s.e. = 0.036) and p-value = 0.006 which is less than 0.01.

Likewise, a significant relationship between perceived cost and E-HRM usage was observed with β = 0.103 (s.e. = 0.051) and p-value = 0.044. It was also observed that there was significant association between E-HRM usage and top management support with β = 0.238 (s.e. = 0.058) and p-value = 0.000 with less than 0.001. Alike, a significant relationship between centralisation and E-HRM usage was observed with β = 0.143 (s.e. = 0.040) and p-value = 0.000 which was less than 0.001. A significant relationship between organisational culture and E-HRM usage was found with β = 0.107 (s.e. = 0.037) and p-value = 0.004 which was less than 0.01. Similarly, significant relationship between competitive pressure and E-HRM usage was observed with β = -0.160 (s.e. = 0.049) and p-value = 0.001 which was less than 0.01.

Next, significant relationship between organisational performance and E-HRM usage was found with β = 0.275 (s.e. = 0.047) and p-value = 0.000 which was less than 0.001. Moreover, a significant relationship between E-HRM usage and Job Satisfaction of HR personnel was detected (β = 0.749 (s.e. = 0.043) and p-value = 0.000 which was less than 0.001). Equally, significant relationship between job satisfaction of HR personnel and E-HRM usage was observed with β = 0.419 (s.e. = 0.051) and p-value = 0.000 which was less than 0.001. However, no significant relationship was observed between relative advantage and E-HRM usage, perceived complexity and E-HRM usage, technology vendor support and E-HRM usage since p-value exceeded 0.05.

Table 4.14: Summary of Overall Fit Statistics – Structural Model 1

Model Fit Summary:		
	Observed Value	Acceptable Fit Standard
Statistical Test		
CMIN (Chi-Square)	3515.322	
DF	1945	
CMIN/DF	1.807	Less than 3 and $p < 0.01$
Fit Indexes		
CFI	0.941	0.90 or larger
RMSEA	0.038	Less than 0.08

Standardised Regression Analysis:			
Relationship	Estimates	S.E	p-value
E-HRM usage ← Senior executives' characteristics	0.403	0.045	0.000
E-HRM usage ← IT expertise of HR personnel	0.225	0.037	0.000
E-HRM usage ← Relative advantage	-0.005	0.074	0.951
E-HRM usage ← Perceived compatibility	0.099	0.036	0.006
E-HRM usage ← Perceived complexity	-0.033	0.028	0.233
E-HRM usage ← Perceived cost	0.103	0.051	0.044
E-HRM usage ← Top management support	0.238	0.058	0.000
E-HRM usage ← Organisational culture	0.107	0.037	0.004
E-HRM usage ← Centralisation	0.143	0.040	0.000
E-HRM usage ← Competitive pressure	-0.160	0.049	0.001
E-HRM usage ← Technology vendor support	0.057	0.061	0.346
Organisational Performance ← E-HRM Usage	0.275	0.047	0.000
Job Satisfaction of HR Personnel ← E-HRM Usage	0.749	0.043	0.000
Organisational Performance ← Job Satisfaction of HR Personnel	0.419	0.051	0.000

In addition, the R^2 for E-HRM usage was 82.9%. The result indicates that the contribution of all the independent variables was about 83% of the variance explained in the intervening variable- E-HRM usage. On the other hand, the R^2 for organisational performance was 62.3%. The result shows that the contribution of all the variables is about 63% of the variance explained in the dependent variable- organisational performance.

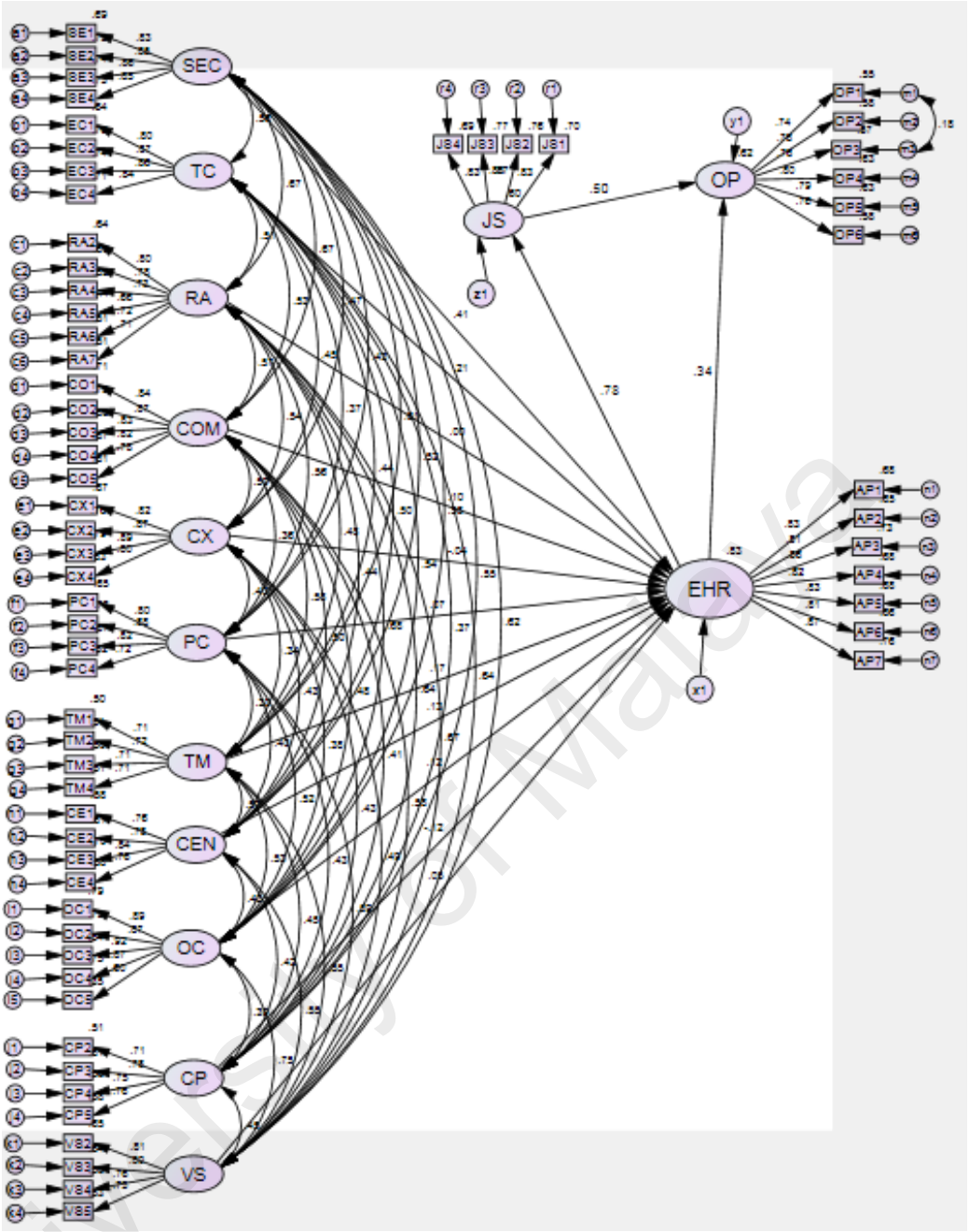


Figure 4.16: Structural Model 1 of E-VALUE Model for E-HRM Usage

4.12 Mediating Role of Job Satisfaction of HR Personnel

For examining the mediating effect of job satisfaction of HR personnel (JS), it is needed to be compared with the structural model with job satisfaction of HR personnel and the structural model without job satisfaction of HR personnel. Consequently, the direct and indirect associations between the independent and dependent variable were analysed.

Table 4.15 shows summary of the structural model 2, without mediating variable – job satisfaction of HR personnel. Based on the SEM fit indexes, the the proposed structural model 2 presents a satisfactory level of goodness-of-fit indexes proposed by Hair et al. (2010). The CFI was 0.945 that was greater than the recommended level of 0.90, and the RMSEA was 0.038 that was lower than the accepted cut off value of 0.08. Besides, the value of CMIN/DF is 1.781 which was lower than the accepted cut off value of less than 3. Overall, the full structured model summary indicates presence of absolute fit. Moreover, the standardised loadings were greater than 0.5 with significant corresponding t-values for all constructs. The graphical presentation of the Model 2 and its full SEM results are shown in Appendix C.

Table 4.15: Summary of Overall Fit Statistics – Structural Model 2

	Observed Value	Acceptable Fit Standard
Statistical Test		
CMIN (Chi-Square)	3029.703	
DF	1701	
CMIN/DF	1.781	Less than 3 and $p < 0.01$
Fit Indexes		
CFI	0.945	0.90 or larger
RMSEA	0.038	Less than 0.08

Moreover, in examining the direct effect of E-HRM usage on organisational performance from structural model 2 (Figure 4.17), Table 4.16 demonstrates that the estimate of standardised regression weight (β1) is 0.592 with p-value of 0.000. So, the result is significant. The complete results of the structural model 2 are enclosed in Appendix C.

Table 4.16: Structural Model without Mediating Variable (JS)

	Beta Eatimate (β1)	S.E	p-value	Result
Organisational Performance ← E-HRM Usage	0.592	0.039	0.000	Significant

Table 4.17 indicates that the value of β1 is reduced from 0.592 to 0.275 p and the result is significant at p-value of 0.000 after including the mediating variable in the structural model. Moreover, E-HRM usage has significant effect on job satisfaction of HR personnel (β2 = 0.749 at p <0.000) and job satisfaction of HR personnel has significant effect on organisational performance (β3 = 0.419 at p <0.000). It indicates that there was a significant indirect effect of E-HRM usage on organisational performance. Thus it is concluded that E-HRM usage has significant direct as well as indirect effect (through the mediating variable - job satisfaction of HR personnel) on organisational performance.

Table 4.17: Structural Model with Mediating Variable (JS)

	Beta Eatimate (β1, β2, β3)	S.E	p-value	Result
Organisational Performance ← E-HRM Usage	0.275	0.047	0.000	Significant
Job Satisfaction of HR Personnel ← E-HRM Usage	0.749	0.043	0.000	Significant
Organisational Performance ← Job Satisfaction of HR Personnel	0.419	0.051	0.000	Significant

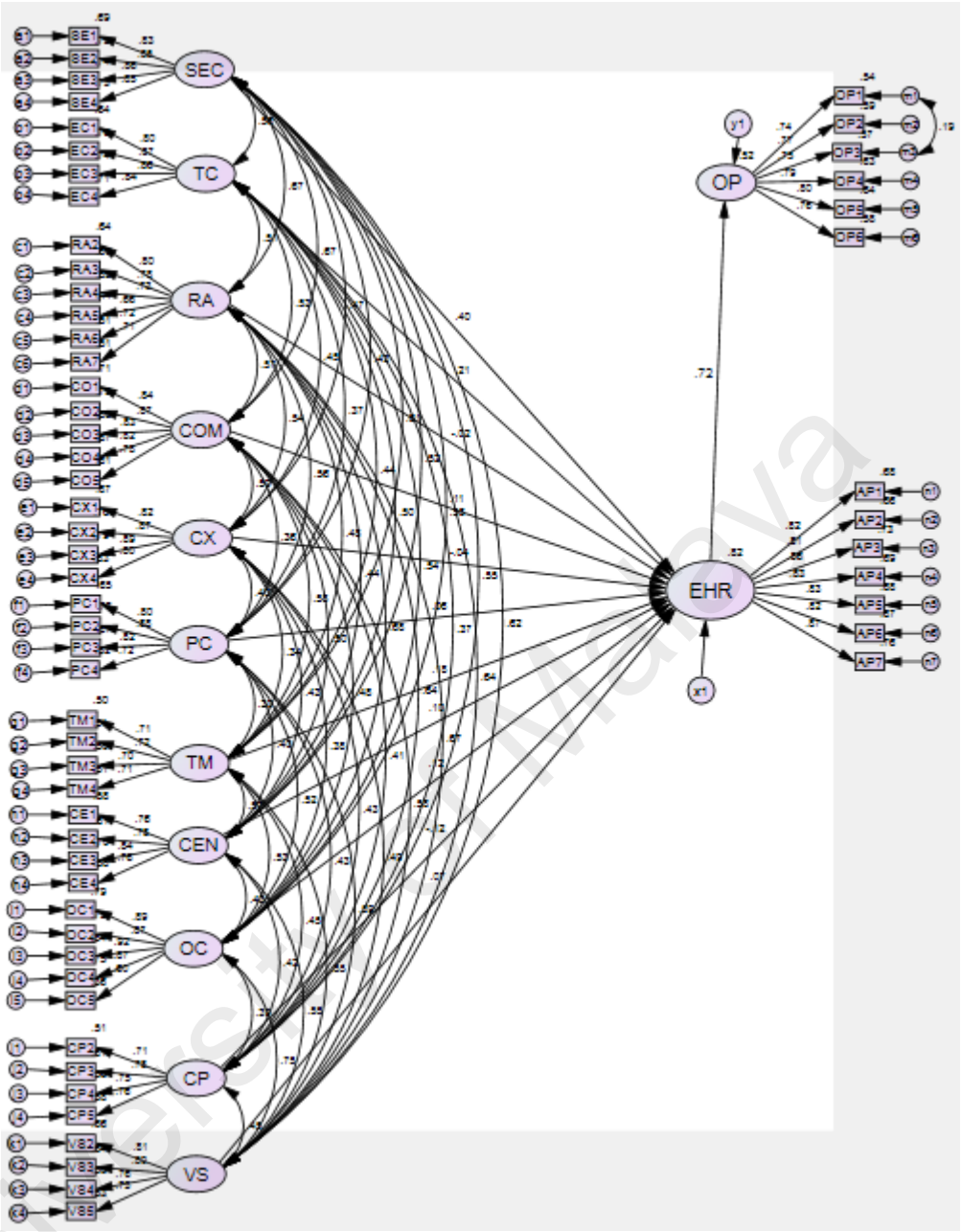


Figure 4.17: Structural Model 2 without Mediating Variable

4.13 Proposed Structural Model 2 of E-VALUE Model for E-HRM Usage

In this stage, the factors which was not significant; relative advantage, perceived complexity, technonology vendor support are excluded from this analysis (Figure 4.18).

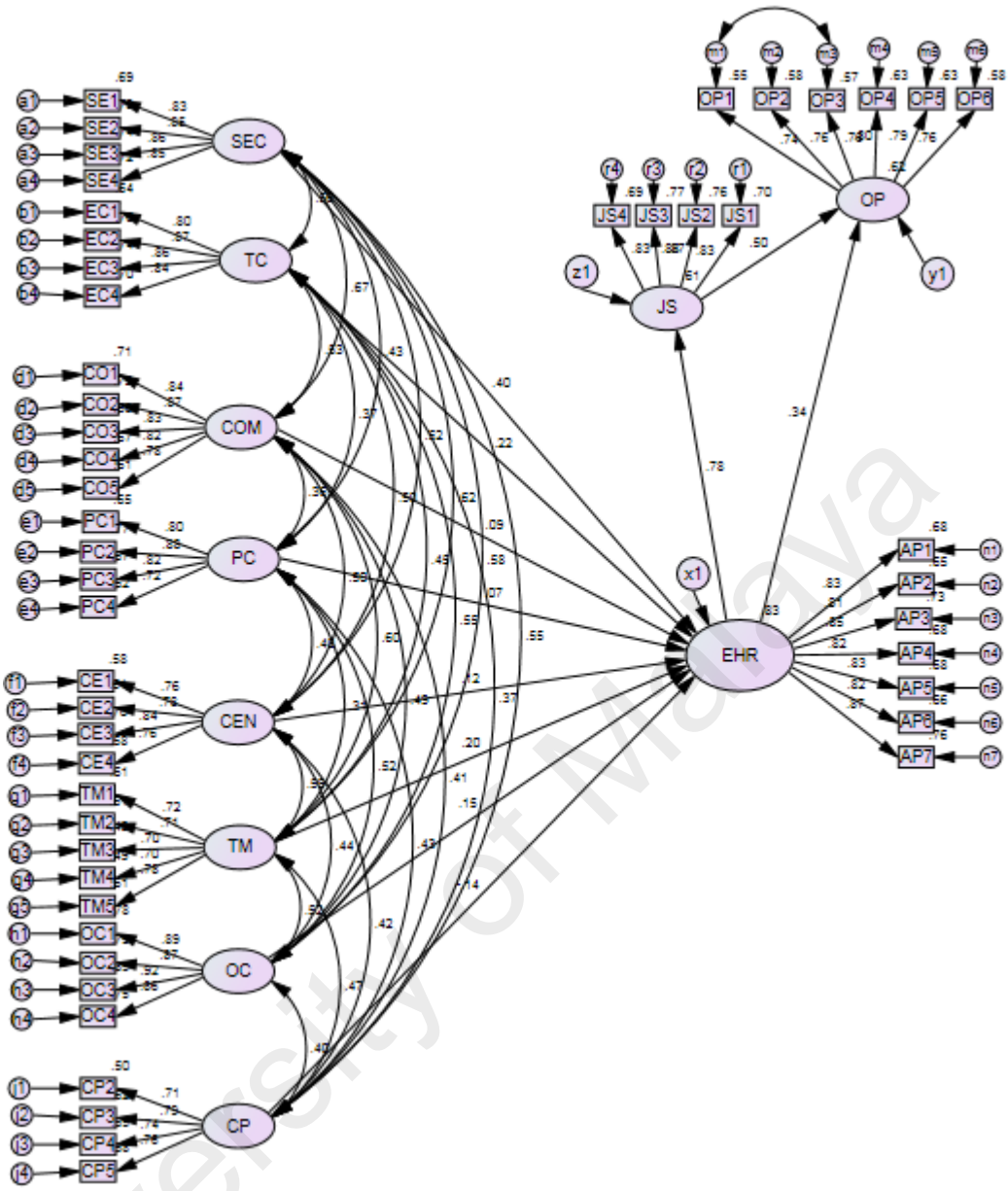


Figure 4.18: Proposed Structural Model (Model 3) of E-VALUE Model for E-HRM

Based on SEM fit indexes (Table 4.18), the results indicate that the proposed structural model 3 presents an acceptable fit. The CFI was 0.954 that was greater than the recommended level of 0.90, and the RMSEA was 0.038 that was lower than the accepted cut off value of 0.08. Besides, the value of CMIN/DF was 1.813 that was also lower than the accepted cut off value of less than 3. Overall, the structural model 3 reports a satisfactory level of the goodness-of-fit measures. Moreover, the standardised

loadings were greater than 0.5 with significant corresponding t-values for all constructs. The complete results of the structural model 3 are enclosed in Appendix C.

Table 4.18: Summary of Overall Fit Statistics –Model 3

Model Fit Summary:		
	Observed Value	Acceptable Fit Standard
Statistical Test		
CMIN (Chi-Square)	2146.963	
DF	1184	
CMIN/DF	1.813	Less than 3 and $p < 0.01$
Fit Indexes		
CFI	0.954	0.90 or larger
RMSEA	0.038	Less than 0.08

Standardised Regression Analysis:			
Relationship	Estimates	S.E	p-value
E-HRM usage ← Senior executives' characteristics	0.399	0.043	0.000
E-HRM usage ← IT expertise of HR personnel	0.230	0.035	0.000
E-HRM usage ← Perceived compatibility	0.087	0.034	0.012
E-HRM usage ← Perceived cost	0.113	0.048	0.017
E-HRM usage ← Top management support	0.284	0.057	0.000
E-HRM usage ← Organisational culture	0.125	0.029	0.000
E-HRM usage ← Centralisation	0.133	0.039	0.000
E-HRM usage ← Competitive pressure	-0.178	0.043	0.000
Organisational Performance ← E-HRM Usage	0.277	0.047	0.000
Job Satisfaction of HR Personnel ← E-HRM Usage	0.750	0.043	0.000
Organisational Performance ← Job Satisfaction of HR Personnel	0.418	0.051	0.000

In structural model 3, the R^2 for E-HRM usage was 83.1%. This result indicates that the contribution of all the independent variables were about 84% of the variance explained in the intervening variable- E-HRM usage. On the other hand, the R^2 for organisational performance was 62.4%. The result shows that the contribution of all the

variables were about 63% of the variance explained in the dependent variable - organisational performance.

4.14 Hypotheses Testing

Covariance-based SEM analysis was employed to test the conceptual model of this study. Covariance-based SEM analysis was suitable for this study because of its model fit indexes and overall variance-covariance matrix features. The conceptual model of the study led to the development of 14 hypotheses in seeking the empirical evidences.

Overall, looking at drivers of E-HRM usage, senior executives' characteristics was identified to have the strongest influence followed by IT expertise of HR personnel, top management support, Centralisation, perceived compatibility, perceived cost, Organisational culture, competitive pressure. Subsequently, E-HRM usage significantly influenced organisational performance, business experience with E-HRM moderated the "E-HRM usage – organisational performance" relationship, and Job Satisfaction of HR Personnel mediates the "E-HRM usage – organisational performance" relationship (see, Appendix C). Details of analysis for each hypothesis were discussed next.

Based on Figure 4.16 and Table 4.14, the relationship between senior executives' characteristics (SEC) and E-HRM usage (EHR) was examined. The estimate of standardised regression weight ($\beta = 0.403$, $p<0.001$) explains that when IT expertise of HR personnel increases by 1 standard deviation, E-HRM usage was increased by 0.403 standard deviation. This indicates the data collected reveals a high positive relationship between senior executives' characteristics and E-HRM usage. As a result, of H1 is failed to reject.

H1: Senior executives' characteristics has influence on E-HRM usage.

Next, in examining the relationship between IT expertise of HR personnel (TC) and E-HRM usage (EHR), Figure 4.16 and Table 4.14 are referenced again. The table demonstrates that IT expertise of HR personnel significantly explains the variance in E-HRM usage ($p<0.001$), and the relationship is positive. The estimate of standardised regression weight ($\beta = 0.225$) explains that when IT expertise of HR personnel is increased by 1 standard deviation, E-HRM usage is increased by 0.225 standard deviation. This indicates the data collected reveals a high and significant positive relationship between IT expertise of HR personnel and E-HRM usage. Thus, H2 is failed to reject.

H2: IT expertise of HR personnel has influence on E-HRM usage.

In looking at the influence of relative advantage (RA) on E-HRM usage (EHR), the standardised estimate (β) from figure 4.16 and Table 4.14 indicates -0.005 with p-value of 0.951. Since the p-value was greater than 0.05, the result was not significant. The result indicates the data collected reveals a negetive relationship between relative advantage and E-HRM usage. Thus, H3 is rejected.

H3: Relative advantage has influence on E-HRM usage.

Based on Figure 4.16 and Table 4.14, the relationship between perceived compatibility (COM) and E-HRM usage (EHR) was examined. The estimate of standardised regression weight ($\beta = 0.099$, $p<0.01$) explains that when perceived compatibility is increased by 1 standard deviation, E-HRM usage is increased by 0.099 standard deviation. This indicates the data collected reveals significantly positive relationship between perceived compatibility and E-HRM usage. As a result, of H4 is failed to reject.

H4: Perceived compatibility has influence on E-HRM usage.

In looking at the influence of perceived complexity (CX) on E-HRM usage (EHR), the standardised estimate (β) from Figure 4.16 and Table 4.14 indicates -0.033 with p-value of 0.233. Since the p-value was greater than 0.05, the result was not significant. The result indicates the data collected reveals a negetive relationship between perceived complexity and E-HRM usage. Thus, H5 is rejected.

H5: Perceived complexity has influence on E-HRM usage.

Next, in examining the relationship between perceived cost (PC) and E-HRM usage (EHR), Figure 4.16 and Table 4.14 demonstrates that perceived cost significantly explains the variance in E-HRM usage ($p<0.05$), and the relationship is positive. The estimate of standardised regression weight ($\beta = 0.103$, $p=0.044$) explains that when IT expertise of HR personnel is increased by 1 standard deviation, E-HRM usage is increased by 0.103 standard deviation. This indicates the data collected reveals highly significantly positive relationship between perceived cost and E-HRM usage. Thus, H6 is failed to reject.

H6: Perceived cost has influence on E-HRM usage.

Based on Figure 4.16 and Table 4.14, the relationship between top management support (TM) and E-HRM usage (EHR) was examined. The estimate of standardised regression weight ($\beta = 0.238$, $p<0.001$) explains that when top management support is increased by 1 standard deviation, E-HRM usage is increased by 0.238 standard deviation. This indicates that the collected data reveal significant positive relationship between top management support and E-HRM usage. As a result, of H7 is failed to reject.

H7: Top management support has influence on E-HRM usage.

Next, in examining the relationship between organisational culture (OC) and E-HRM usage (EHR). Figure 4.16 and Table 4.14 were referenced. The estimate of standardised regression weight ($\beta = 0.107$, $p = 0.004$) explains that when organisational culture is increased by 1 standard deviation, E-HRM usage is increased by 0.107 standard deviation. Thus, a high and significantly positive relationship between organisational culture and E-HRM usage. Thus, failed to reject H8.

H8: Organisational culture has influence on E-HRM usage.

Based on Figure 4.16 and Table 4.14, the relationship between centralisation (CEN) and E-HRM usage (EHR) was examined. The estimate of standardised regression weight ($\beta = 0.143$, $p<0.001$) explains that when centralisation is increased by 1 standard deviation, E-HRM usage is increased by 0.143 standard deviation. AS such, this reveals that a highly positive relationship between centralisation and E-HRM usage. As a result, of H9 is failed to reject.

H9: Centralisation has influence on E-HRM usage.

Next, in examining the relationship between competitive pressure (CP) and E-HRM usage (EHR), Figure 4.16 and Table 4.14 were referenced again. The table demonstrates that IT expertise of HR personnel significantly explains the variance in E-HRM usage ($p<0.01$), and the relationship is positive. The estimate of standardised regression weight ($\beta = -0.160$, $p = 0.001$) explains that when competitive pressure is increased by 1 standard deviation, E-HRM usage is increased by 0.107 standard deviation. This indicates the data collected reveals a high and significantly negative relationship between competitive pressure and E-HRM usage. Thus, H10 is failed to reject.

H10: Competitive pressure has influence on E-HRM usage.

In looking at the influence of technology vendor support (VS) on E-HRM usage (EHR), the standardised estimate (β) from Figure 4.16 and Table 4.14 indicates 0.057 with p-value of 0.346. Since the p-value was greater than 0.05, the result was not significant. The result indicates the data collected reveals a positive relationship between technology vendor support and E-HRM usage, and the relationship is also not significant. Thus, H11 is rejected.

H11: Technology vendor support has influence on E-HRM usage.

Based on figure 4.16 and Table 4.14, the relationship between E-HRM usage (EHR) and organisational performance (OP) was examined. The estimate of standardised regression weight ($\beta = 0.275$, $p<0.001$) explains that when E-HRM usage is increased by 1 standard deviation, organisational performance is increased by 0.275 standard deviation. This indicates the data collected reveals a high and significantly positive relationship between E-HRM usage and organisational performance. As a result, of H12 is failed to reject.

H12: E-HRM usage has influence on organisational performance.

In order to explain the outcome of H13, it is to refer to the Figures 4.16 and 4.17, as well as Tables 4.14 and 4.14 are collectively needed to be referenced. The mediating effect of job satisfaction of HR personnel to the relationship between E-HRM usage and organisational performance was examined. To calculate the mediating effect, it is needed to analysis the hypotheses H12, H13 (a) and H13 (b). The hypothesis H12 earlier shows that E-HRM usage has a direct relationship with organisational performance. Now, it is needed to examine whether E-HRM usage has an indirect relation with organisational performance.

The relationship between E-HRM usage (EHR) and job satisfaction of HR personnel was examined based on Figure 4.16 and Table 4.14. It was found that E-HRM usage had significant positive relationship with job satisfaction of HR personnel ($p<0.001$, $\beta = 0.749$). If there is an increase in E-HRM usage by 1 standard deviation, organisational performance increases by 0.749 standard deviations. Thus, H13(a) is failed to reject.

When examining the relationship between E-HRM usage (EHR) and job satisfaction of HR personnel (JS), Figure 4.16 and Table 4.14 were referenced again. The table demonstrates that IT expertise of HR personnel significantly explains the variance in E-HRM usage ($p<0.01$), and the relationship is positive. The estimate of standardised regression weight ($\beta = 0.749$, $p = 0.001$) explains that when E-HRM usage is increased by 1 standard deviation, job satisfaction of HR personnel is increased by 0.107 standard deviation. This reveals a highly significantly positive relationship between E-HRM usage and job satisfaction among the HR personnel. Thus, H13 (a) is failed to reject.

H13(a): E-HRM usage has impact on job satisfaction of HR personnel.

By looking at the influence of job satisfaction of HR personnel on organisational performance, Figure 4.16 and Table 4.14 indicate the standardised estimate is 0.419 with p-value of 0.000. Here, p-value is less than 0.001, it was concluded that the data collected acheived to observe significant relationship between job satisfaction of HR personnel on organisational performance. Thus, H13(b) is failed to reject.

Based on Figure 4.16 and Table 4.14, the relationship between job satisfaction of HR personnel (JS) and organisational performance (OP) was examined. The estimate of standardised regression weight ($\beta = 0.419$, $p<0.01$) explains that when job satisfaction of HR personnel is increased by 1 standard deviation, organisational performance is increased by 0.419 standard deviation. This reveals a highly significant positive

relationship between job satisfaction of HR personnel and organisational performance. As a result, of H13 (b) is failed to reject.

H13(b): Job satisfaction of HR Personnel has impact on organisational performance.

Before including the mediator - job satisfaction of HR personnel- in the structural model 2, Figure 4.17 together with Table 4.16 needs to be referenced. Now, it is essential to examine the presence of direct relationship between E-HRM usage and organisational performance. Figures 4.17 and Table 4.16 indicates the estimate of standardised regression weight (β) is 0.592 with p-value of 0.000. So, the result is significant. The structural model with the mediating variable (Figure 4.16), the value of β is decreased as 0.275 (Table 14/Table 17) and the result is significant at p-value of 0.000 which is failed to reject the hypothesis - H12. So, the type of mediation is partial. Since, the direct effect of E-HRM usage on organisational performance is still significant after including the moderating variable (job satisfaction of HR personnel) into the structural model (Figure 16), even though β is reduced.

Overall, job satisfaction of HR personnel partially mediates the relationships between E-HRM usage with organisational performance. Hence, this indicates that H13 is failed to reject.

H13:Job satisfaction of HR personnel acts as the mediation on the relationship between E-HRM usage and organisational performance

One of the objectives of this study is to examine the moderating effect of business experience with E-HRM on the relations between E-HRM usage (EHR) and organisational performance (OP). In this study, the moderating effect of business experience with E-HRM was analysed using linear regression. Linear regression has been used in many studies to test the moderating effect e.g. Salwani et al. (2009).

Changes in R^2 signified the influence of moderating variable business experience with E-HRM (years) in the model. In structural model 1 (Figure 4.16), the inclusion of moderator (for which the interaction was calculated based on [E-HRM usage] x [business experience with E-HRM in years]) had resulted an increase in R^2 of organisational performance from 50.6% to 51.6% (1% increase in R^2, p=<0.001). Thus, H14 is failed to reject. Business experience with E-HRM (measured in number of years) has positive influence on "E-HRM usage – organisational performance" relationship. For additional statistical outputs, please refer to Appendix C.

H14:Business experience with E-HRM acts as the mediator on the relationship between E-HRM usage and organisational performance.

4.15 Summary of Results

Looking at the drivers of E-HRM usage; senior executives' characteristics, IT expertise of HR personnel, perceived compatibility, perceived cost, organisational culture, top management support, centralisation and competitive pressure were found to be predictors of E-HRM usage in the organisations of Bangladesh. According to structural model 1, senior executives' characteristics appeared to be the strongest predictor (β = 0.403) followed by top management support (β = 0.238), IT expertise of HR personnel (β = 0.225), competitive pressure (β = -0.160), centralisation (β = 0.143), organisational culture (β = 0.107), perceived cost (β = 0.103), and perceived compatibility (β = 0.099). Other factors including relative advantage, perceived complexity, and technology vendor support were found to have non-significant relationship (full results are shown in Appendix C). The status of hypothesis testing is summarized in Table 4.19.

In structural model 1, it was assessed that the predictors of E-HRM usage explained 83% of its variance with R^2 of 82.9 % (squared multiple correlations = 0.829) (Figure 4.16). In structural model 2, it was assessed that the predictors of E-HRM usage explained 82% of its variance with R^2 of 81.9 % (squared multiple correlations = 0.819) (Figure 4.17). Similarly, it was assessed that the predictors of E-HRM usage explained 84% of its variance with R^2 of 83.1 % (squared multiple correlations = 0.831) in structural model 3 (Figure 4.18). So, it was found that E-HRM usage has a positive significant relation with organisational performance in all of 3 structural models.

The mediation effect of Job satisfaction of HR personnel on the "E-HRM usage – organisational performance" relationship indicated that mediation is partial. Since, the direct effect of E-HRM usage on organisational performance is still significant after the moderating variable (job satisfaction of HR personnel) inclusion into the structural model 1 (Figure 16), even though β is reduced.

Further analysis on the "E-HRM usage –organisational performance" relationship indicated that E-HRM usage significantly influenced business performance (in a positive way). The higher the usage, the better the performance. Moderating variable-business experience with E-HRM was found to significantly influence the "E-HRM usage – organisational performance" relationship. The inclusion of moderator variable, business experience with E-HRM (years) in the model, had resulted an increase in R^2 of business performance from 50.6% to 51.6%. Based on SEM results, the predictors of business performance explained 51.6% of its variance (Figure 4.18).

Table 4.19: Outcomes of Hypotheses Testing

	Hypotheses	Result
H1:	Senior executives' characteristics has influence on E-HRM usage.	Failed to Reject
H2:	IT expertise of HR personnel has influence on E-HRM usage.	Failed to Reject
H3:	Relative advantage has influence on E-HRM usage.	***Rejected***
H4:	Perceived compatibility has influence on E-HRM usage.	Failed to Reject
H5:	Perceived complexity has influence on E-HRM usage.	***Rejected***
H6:	Perceived cost has influence on E-HRM usage.	Failed to Reject
H7:	Top management support has influence on E-HRM usage.	Failed to Reject
H8:	Organisational culture has influence on E-HRM usage.	Failed to Reject
H9:	Centralisation has influence on E-HRM usage.	Failed to Reject
H10:	Competitive pressure has influence on E-HRM usage.	Failed to Reject
H11:	Technology vendor support has influence on E-HRM usage.	***Rejected***
H12:	E-HRM usage has influence on organisational performance.	Failed to Reject
H13:	Job satisfaction of HR personnel acts as the mediation on the relationship between E-HRM usage and organisational performance.	Failed to Reject
H14:	Business experience with E-HRM acts as the moderator on the relationship between E-HRM usage and organisational performance.	Failed to Reject

4.16 Chapter Summary

This chapter on data analysis commences with the actual administration of the survey. Subsequently, the data coding and treatment of missing data were explained. Descriptive statistics were presented and a summary of the demographic profile of the respondents and the firms that participated in this study was given. Next, multivariate assumptions including normality, outliers, linearity, homoscedasticity and multicollinearity were examined. The subsequent sections of this chapter showed the

results of the tests for nonresponse bias and common method bias respectively. Purity of the scales were used in this study was assessed using item-total-correlation and Cronbach's alpha. This is followed by exploratory factor analysis for the independent variables and mediating variable. Measurement model was developed for every construct. Full structural model analysis, moderating effect and moderating effects analysis were carried out in order to test the fourteen hypotheses. The outcomes of the hypotheses testing were briefly discussed. In the next, Chapter 5, the conclusion and discussions of this study are discussed.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.1 Introduction

The previous chapter discussed the data analysis for the data collected. Different multivariate assumptions and techniques were used to check the reliability and validity of data. SEM analysis was employed to test the E-VALUE model fit, and proposed hypothesis were examined. In section 5.2, summary of research is explained. The section 5.3 entails the key findings as well as the discussion of the results. The results found are then compared with the ones which appear to be similar as identified in the literature. In section 5.4, several empirical and methodological contributions are presented. The contribution of the study in closing the gaps of knowledge is discussed in section 5.5, and this chapter includes a number of important practical implications in section 5.6. Some limitations regarding this study are listed in section 5.7. Section 5.8 indicates suggestions for future research.

5.2 Summary of Research

The objective of this research is to recognise the issues that are linked with the E-HRM usage at organisational level and the impact of E-HRM technology on organisational performance. The study developed the following four main research questions:

Question (1): What are the factors that influence E-HRM adoption in organisations?

Question (2): Is there an association between E-HRM usage and organisational performance?

Question (3): How does HR personnel's job satisfaction mediate the relationship between E-HRM usage and organisational performance?

Question (4): How does business experience with E-HRM (measured in number of years) moderate the relationship between E-HRM usage and organisational performance?

This research tried to supply answers to the above mentioned questions by completing the following research objectives:

Objective (1): To explore the factors influencing the usage of E-HRM among organisations in Bangladesh.

Objective (2): To investigate the association between E-HRM usage and organisational performance.

Objective (3): To determine whether 'job satisfaction of HR personnel' mediates the relationship between E-HRM usage and organisational performance.

Objective (4): To examine whether 'business experience with E-HRM' (measured in number of years) moderates the relationship between E-HRM usage and organisational performance.

Based on prior findings in the E-HRM and related IT literature, the final independent variables and dependent variable were selected to serve in the development of the overall research framework. The research framework - E-VALUE model – is made up of eleven independent variables, one intervening variable, one moderating variable, one mediating variable and one dependent variable (Figure 3.1).

5.3 Discussion on Findings

The research met the objectives set. It provided knowledge enhancement in the organisations in Bangladesh by identifying the potential factors of E-HRM usage and its value creations, how E-HRM usage influence the organisational performance, how job satisfaction of HR personnel influence the "E-HRM usage – organisational performance" relationship, and how business experience with E-HRM significantly influence the "E-HRM usage - organisational performance" relationship. Furthermore,

the use of the E-VALUE model as it contributed to knowledge enhancement demonstrated its applicability to assess E-HRM issues. Based on examination of click and mortar firms at various levels of experience in IT applications in business, the study presented a multidimensional view of both the adoption and post-adoption E-HRM and value creations. Figure 4.16 and Table 4.14 were considered for further discussion.

Knowledge enhancement was made by providing empirical evidences on issues related to E-HRM applications in both manufacturing and service industries in Bangladesh. The proposed model 1 and 2 indicated that 11 hypothesised relationships (Hypotheses 1, 2, 4, 6, 7, 8, 9, 10, 12, 13 and 14) out of 14 were supported, while three hypothesised relationships (Hypotheses 3,5 and 11) were not significantly supported. The SEM and hypotheses results indicate that senior executives' characteristics, IT expertise of HR personnel, perceived compatibility, perceived cost, top management support, organisational culture, centralisation, and competitive pressure were significant factors of E-HRM usage. Other factors (relative advantage, perceived complexity, and technology vendor support) were found to have non-significant relationship. Looking at how E-HRM usage influenced organisational performance, significant positive relationship was established. Besides, job satisfaction of HR personnel' partially mediated the relationship "E-HRM usage - organisational performance". Again, years of business experience with E-HRM was found to moderate the "E-HRM usage - organisational performance" relationship. The E-VALUE model was concluded to be an over-identified model and the model fitted well with the data. Hence, the E-VALUE model could be considered as a multi-dimensional theoretical model in evaluating factors identifying E-HRM usage on organisational performance in the organisations of Bangladesh. In the following sections, these findings will be discussed in detail. Table 5.1 explains the hypotheses tested concerning the way people were affected following the answers to objectives research questions.

Table 5.1: Summary of Research Findings

Research Questions	Research Objectives	Research Hypotheses	Research Findings	Consistent with Prior Research Findings
1. What are the factors that influence E-HRM adoption in organisations?	1. To explore the factors influencing the usage of E-HRM among organisations in Bangladesh.	H1: Senior executives' characteristics has influence on E-HRM usage.	Failed to Reject	Agarwal and Prasad (1998); Alshamaila et al. (2013); Al-Qirim (2008); Ghobakhloo et al. (2011); Jeon et al. (2006); Rahayu and Day (2015); Sophonthummapharn (2009); Thong (1999); Thong and Yap (1995)
		H2: IT expertise of HR personnel has influence on E-HRM usage.	Failed to Reject	Aboelmaged (2014); Ahmadi et al. (2015); Askool & Nakata (2012); Hameed et al. (2012a); Gutierrez et al. (2015); Kuan and Chau (2001); Lian et al. (2014); Bian (2012); Oliveira and Martins (2010); Oliveira et al. (2014); Teo et al. (2007); Troshani et al. (2011); Zhu and Kraemer (2005); Zhu et al. (2006)
		H3: Relative advantage has influence on E-HRM usage.	***Rejected***	Al-Mobaideen et al. (2013); Gutierrez et al. (2015); Hung et al. (2015); Lian et al. (2014); Bian (2012)
		H4: Perceived compatibility has influence on E-HRM usage.	Failed to Reject	Ahmad et al. (2014); Al-Dmour (2014); Alshamaila et al. (2013); Chong and Chan (2012); England and Stewart (2007); Ghobakhloo et al. (2011); Gangwar et al. (2015); Bian (2012); Ramdani et al. (2013); Sophonthummapharn (2009); Teo et al. (2007)

Table 5.1 continued: Summary of Research Findings

Research Questions	Research Objectives	Research Hypotheses	Research Findings	Consistent with Prior Research Findings
		H5: Perceived complexity has influence on E-HRM usage.	***Rejected***	Alshamaila et al. (2013); Ahmadi et al. (2015); Al-Qirim (2008); Ahmad et al. (2014); Bian (2012); Low et al. (2011); Sila (2013); Teo et al. (2007)
		H6: Perceived cost has influence on E-HRM usage.	Failed to Reject	Chong (2004); Chong and Chan (2012); Clark and Saunders (1992); Iacovou et al. (1995); Kuan and Chau (2001); Lin (2014); Sila (2013)
1. What are the factors that influence E-HRM adoption in organisations?	1. To explore the factors influencing the usage of E-HRM among organisations in Bangladesh.	H7: Top management support has influence on E-HRM usage.	Failed to Reject	Al-Dmour (2014); Alshamaila et al. (2013); Chong and Chan (2012); Gangwar et al. (2015); Hameed et al. (2012a); Lian et al. (2014); Lin (2014); Li, Pillutla, Zhou and Yao (2015); Bian (2012); Low et al. (2011); Ngai and Wat (2006); Oliveira et al. (2014); Ramdani et al. (2013); Sila (2013); Teo et al. (2007); Troshani et al. (2011); Teo et al. (2009)
		H8: Organisational culture has influence on E-HRM usage.	Failed to Reject	ALdayel, Aldayel and Al-Mudimigh (2011); Chou (2003); Jackson (2011); Indeje and Zheng (2010); Li et al. (2015); Mayfield et al. (2003); Panayotopoulou et al. (2007)

Table 5.1 continued: Summary of Research Findings

Research Questions	Research Objectives	Research Hypotheses	Research Findings	Consistent with Prior Research Findings
		H9: Centralisation has influence on E-HRM usage.	Failed to Reject	England and Stewart (2007); Etllie et al. (1984); Pierce and Delbecq (1977) Troshani et al. (2011); Zmud (1982)
1. What are the factors that influence E-HRM adoption in organisations?	1. To explore the factors influencing the usage of E-HRM among organisations in Bangladesh.	H10: Competitive pressure has influence on E-HRM usage.	Failed to Reject	Al-Dmour (2014); Al-Qirim (2008); Askool and Nakata (2012); Chong and Chan (2012); Ghobakhloo et al. (2011); Gutierrez et al. (2015); Gangwar et al. (2015); Lin (2014); Bian (2012); Low et al. (2011); Oliveira and Martins (2010); Ramdani et al. (2013); Sila (2013); Sophonthummapharn (2009); Zhu and Kraemer (2005); Zhu et al. (2006)
		H11: Technology vendor support has influence on E-HRM usage.	***Rejected***	Ahmadi et al. (2015); Al-Qirim (2008); Rahayu & Day (2015)
2. Is there an association between E-HRM usage and organisational performance?	2. To investigate the association between E-HRM usage and organisational performance.	H12: E-HRM usage has influence on organisational performance.	Failed to Reject	Gardner et al. (2003); Ruël & van der Kaap (2012); Sadiq et al. (2013); Salwani et al. (2009)

Table 5.1 continued: Summary of Research Findings

Research Questions	Research Objectives	Research Hypotheses	Research Findings	Consistent with Prior Research Findings
		H13 (a): E-HRM usage has impact on job satisfaction of HR personnel.	Failed to Reject	Beckers and Bsat (2002); Chang et al. (2012); Maier et al. (2013)
3. How does HR personnel's job satisfaction mediate the relationship between E-HRM usage and organisational performance?	3. To determine whether 'job satisfaction of HR personnel' mediates the relationship between E-HRM usage and organisational performance.	H13 (b): Job satisfaction of HR personnel has impact on organisational performance.	Failed to Reject	Chang et al.(2012); Kim et al.(2005); Maier et al. (2013); Muterera et al. (2015); Rodrigues and Carlos (2010); Shiu and Yu (2010)
		H13: Job satisfaction of HR personnel acts as the mediator on the relationship between E-HRM usage and organisational performance	Failed to Reject	Supports H13 (a) & H13 (b)
4. How does business experience with E-HRM (measured in number of years) moderate the relationship between E-HRM usage and organisational performance?	4. To examine whether 'business experience with E-HRM' (measured in number of years) moderates the relationship between E-HRM usage and organisational performance	H14: Business experience with E-HRM acts as a moderator on the relationship between E-HRM usage and organisational performance.	Failed to Reject	Salwani et al. (2009)

5.3.1 Significant Variables

5.3.1.1 Senior Executives' Characteristics as a Factor to E-HRM Usage

Looking at factors to E-HRM usage, it is observed that the proposed hypothesis H1 is supported. So, there is a positive association between senior executives' characteristics and E-HRM usage. As can be seen in Appendix C, this study was found to provide empirical evidence that senior executives' characteristics was found to be the strongest factor that influenced E-HRM usage ($\beta = 0.403$, $p<0.001$) compared with the other variables in the proposed model. This result shows that the effect of senior executives' characteristics on E-HRM usage is the most important factor among selected eleven factors. This means that IT knowledge and innovativeness of CEOs or owners is the core determinant of E-HRM usage in organisations of Bangladesh. In a nutshell, the senior executives can take strategic role and have authority to control the organisational attitude toward new technology adoption.

The present result is consistent with earlier research that revealed that IT knowledge and innovativeness of CEOs decreases the degree of uncertainty for using new IT applications. As Attewell's (1992) theory, the lower the knowledge and skill barriers is, the more likely one organisation will adopt information system. This result not only supports the findings of previous research in Western nations like New Zealand (Al-Qirim, 2008) and United States (Agarwal and Prasad, 1998), but also confirms the results of research conducted in developing nations such as Malaysia (Ahmad et al., 2014), Indonesia (Rahayu & Day, 2015) and Singapore (Thong & Yap, 1995; Thong, 1999). Moreover, the present finding also consistent with the finding of Ghobakhloo et al. (2011), where authors revealed CEO's innovativeness as one of the most significant determinants for new IT application adoption, though they reported CEO's IT knowledge as an non-significant factor in Iranian setting. This result is inconsistent with the findings of prior research conducted on Malaysia (Ahmadi et al., 2015) and Taiwan (Lian et al., 2014).

5.3.1.2 IT Expertise of HR Personnel as a Factor to E-HRM Usage

Proposed hypothesis H2 was supported by the findings of this study. So, there happen to be a positive relationship between IT expertise of HR personnel and E-HRM usage. As can be seen in Appendix C, the relative impact of IT expertise of HR personnel on E-HRM usage is the third highest ($\beta = 0.225$, $p<0.001$) compared with the others independent variables in the proposed model. This means that organisations should keenly confirm IS/IT ability of the workers before finalising on the decision about the adoption of a current technology. Thus, the new IS change will scrap off the traditional working process of organisations. Operating knowledge is compulsory and the employees should have a hint regarding the effects of the technology. At times, the combination of the new IS and the existing IS is necessary in an organisation. Therefore, the stuff is required to have IT knowledge and skill that will enable them to fit in the organisation. It is always known that workers who are qualified provide ideas of innovation of the organisation. Because, they can utilise the data output by highly computerised systems and increasing the profits of new systems. Thus, managers and policy makers need to focus on technological resources such as physical infrastructures, intangible knowledge, and hiring of employees with IT skills. Also, managers need to understand that employing specialised IT workforce with skill sets across the conventional IT environment and developing strategic projects to support business growth enable E-HRM adoption.

This finding is supported by earlier studies. Researchers argued that the lower the knowledge and skill barriers is, the more likely one firm will adopt IT applications (Attewell, 1992). The results of previous research in developed nations like European Union (EU) nations (Oliveira & Martins, 2010), Portugal (Oliveira et al., 2014), United Kingdom (Gutierrez et al., 2015), Australia (Troshani et al., 2011) validate the finding of this study. Moreover, the results of research conducted in developing nations such as

United Arab Emirates (Aboelmaged, 2014), Saudi Arabia (Askool & Nakata, 2012), Malaysia (Ahmadi et al., 2015), Singapore (Thong, 1999; Teo et al., 2007), Taiwan (Lian et al., 2014) and China (Bian, 2012) support the finding of the current study. However, the results are inconsistent with the previous research findings conducted on developing nations such as Jordan Jordan (Al-Mobaideen et al., 2013; Al-Dmour, 2014) and Taiwan (Low et al., 2011).

5.3.1.3 Perceived Compatibility as a Factor to E-HRM Usage

Observing the factors to E-HRM usage, the finding of this particular study supported the suggested hypothesis H4. Thus, there exists a positive relationship between perceived compatibility and E-HRM usage. As can be seen in Appendix C, the relative impact of perceived compatibility on E-HRM usage is the second lowest ($\beta = 0.099$, $p<0.01$) compared with the others independent variables (those are significant) in the proposed model. This means that compatibility was recognised as an important factor for E-HRM usage. It can be seen that one of the important reasons for those companies which use E-HRM is due to E-HRM currently is compatible with their existing operating practices, values and beliefs, and IT infrastructure. Accordingly, it indicates that organisations realised that E-HRM should be in line with the existing systems, levels and work guidelines in the organisation for effective and strategic HRM.

The finding is appropriate with preceding research that got compatibility to be a significant facet that affects the usage of a technology innovation. This result not only supports the finding of previous research on different IT applications adoption in Western nations like England (Alshamaila et al., 2013; Ramdani et al., 2013) and Australia (England & Stewart, 2007), but also confirms the results of research conducted in developing nations such as Malaysia (Ahmad et al., 2014; Chong & Chan, 2012), Joardan (Al-Dmour, 2014), Iran (Ghobakhloo et al., 2011), China (Bian, 2012), Singapore (Teo et al., 2007), Thailand (Sophonthummapharn, 2009) and India (Gangwar et al., 2015). On the

contrary, this result happens to be inconsistent compared to the prior findings on IT innovation conducted in Western nations such as United Kingdom (Gutierrez et al., 2015) and Portugal (Oliveira et al., 2014), and also in developing nations Malaysia (Ahmad et al., 2015), Indonesia (Rahayu & Day, 2015) and Taiwan (Lian et al., 2014; Low et al., 2011; Hung et al., 2015).

5.3.1.4 Perceived Cost as a Factor to E-HRM Usage

Ideally, the finding of the study supports the suggested hypothesis H6 indicating that there is a positive relationship between perceived cost and E-HRM Usage. As can be seen in Appendix C, the relative impact of perceived cost on E-HRM Usage is ($\beta = 0.103$, $P<0.05$) compared with the other independent variables in the proposed model. This means that perceived cost is found to an important consideration to adopt E-HRM by organisations in Bangladesh. One possible explanation is that organisations are more concern with the return on investments than the actual financial resources they have. Despite the fact that the costs of the set ups are low, there are other expenses like subsequent training costs as well as other ongoing expenses that may become a hindrance for E-HRM adoption. The training of the staff is important in the implementation of the new IS. Huge costs hinder the firm from the investment and adoption of E-HRM. Apart from this findings support on previous literature, it also emphasises on the disagreement concerning the costs in any IT innovation such as E-HRM adoption.

The results of previous research on developed nations like Canada (Iacovou et al., 1995), North America (Sila, 2013), United States (Chong (2004; Clark & Saunders, 1992) and on developing nations such as Hong Kong (Kuan & Chau, 2001), Malaysia (Chong & Chan, 2012), Taiwan (Lin, 2014) support the finding of the current study. Consequently, the result of the present study rejects the earlier findings on Iran (Ghobakhloo et al., 2011), Indonesia (Rahayu & Day, 2015), Korea (Jeon et al., 2006), New Zealand (Al-Qirim, 2008), Taiwan (Hung et al., 2015; Teo et al., 2009).

5.3.1.5 Top Management Support as a Factor to E-HRM Usage

Looking at factors to E-HRM usage, the result of this study supports the suggested hypothesis H7. Subsequently, there exists a great relationship between top management support and E-HRM usage. As can be seen in Appendix C, the relative impact of top management support on E-HRM usage is the second highest ($\beta = 0.238$, $p<0.001$) compared with the others independent variables in the proposed model. Evidence from the study indicates that top management support can influence the E-HRM usage in organisations of Bangladesh. It is also agreed that if there is support from the leading management, it will create an easy way to deal with the distractions experienced during the adoption. The top level of management is supposed to take up the role of ensuring it caters for finances as well as the provision of enough resources to ensure a fruitful building E-HRM. Inadequate financial support and resources will automatically lead to the downfall of the firm. A detailed E-HRM needs a budget that can be implemented and maintained. In case the top management lacks the idea on how the E-HRM brings success to the company, they won't issue enough resources on the effort of implementing the organisation. Support from top management is vital in overcoming possible internal opposition to the adoption of E-HRM, since adopting the E-HRM may impact work practices significantly.

The results of previous research in developed nations like Australia (Troshani et al., 2011), England (Alshamaila et al., 2013; Ramdani et al., 2013) and North America (Sila, 2013) validate the finding of this study. Moreover, the results of research conducted in developing nations such as China (Bian, 2012; Li et al., 2015), Hong Kong (Ngai & Wat, 2006), India (Gangwar et al., 2015), Jordan (Al-Dmour, 2014), Malaysia (Chong & Chan, 2012), Portugal (Oliveira et al., 2014), Singapore (Teo et al., 2007; Teo et al., 2009) and Taiwan (Low et al., 2011; Lin, 2014; Lian et al., 2014) support the finding of the current study. Accordingly, the present result confronts the finding of the studies where researchers reported top management support as an non-significant factor in E-HRM usage such as

Jordan (Al-Mobaideen et al., 2013), Malaysia (Ahmadi et al., 2015), Taiwan (Hung et al., 2015) and United Kingdom (Gutierrez et al., 2015).

5.3.1.6 Organisational Culture as a Factor to E-HRM Usage

Seeing at factors to E-HRM usage, the study was found to give the real evidence that organisational culture was found to be one of the strongest factors that influenced E-HRM usage ($\beta = 0.107$, $p<0.01$). The finding of this particular study supported the suggested hypothesis H8 that exists a positive relationship between organisational culture and E-HRM usage. As can be seen in Appendix C, the relative impact of organisational culture on E-HRM usage is statistically significant compared with the other variables in the proposed model. This means that organisational culture is an important consideration when organisations of Bangladesh adopting an information system. Thus E-HRM adoption and use are enhanced through cultivation of an organised culture, that triggers IT applications integrations in organisational in the promotion of joining together of various departments such as HR and IT, so as to make the changes in the institutions. Whenever there is enough support and a good organisational culture the chances of the usage of the applications of E-HRM will result to become extremely high.

The results of previous research on Western nation like Greece (Panayotopoulou et al., 2007) and in developing nations such as China (Li et al., 2015), Kenya (Indeje & Zheng, 2010), Saudi Arabia (ALdayel et al., 2011) and Taiwan (Chou, 2003) support the finding of the current study. Also, the finding of Teo et al. (2009), conducted a reserch on Singapore, was rejected who stated that organisational culture is an non-significant factor for IT application adoption.

5.3.1.7 Centralisation as a Factor to E-HRM Usage

Regarding the findings of this kind of study there are supports of the suggested hypothesis H9 that indicates that there exist a positive relationship between centralisation and E-HRM usage. As can be seen in Appendix C, the relative impact of centralisation on E-HRM usage is the moderate ($\beta = 0.143$, $p<0.001$) compared with the others variables in the proposed model. So, this study is found to provide empirical evidence that centralisation is identified to be one of the strongest factors that influenced E-HRM usage. Therefore, this finding supports that if the decision making process is centralised it diminishes cases of wrangles among the firm units and reinforces the adoption of technology process. Moreover, the overall head structure is prone to the adoption of the current technologies in organisations of Bangladesh. Thus, the centralised system of an organisation triggers to more efficient end users of an information system, and the adopting of fruitful applications of information systems in the organisations of Bangladesh.

This finding contributes to the outcome of the studies done in developed nations like the United States (Zmud, 1982; Etllie et al., 1984) and Australia (England & Stewart, 2007; Troshani et al., 2011). More notably, the result of this research shows inconsistency with the other notable things of prior research that was done in some developed and developing nations like United States (Gatignon & Robertson, 1989; Williams et al., 1998), Saudi Arabia (Askool & Nakata, 2012) and Jordan (Al-Dmour, 2014).

5.3.1.8 Competitive Pressure as a Factor to E-HRM Usage

Looking at factors to E-HRM usage, the finding of this study supports the proposed hypothesis H10. With a significant negative path, competitive pressure was found to be one of the strongest factors in the research model. As can be seen in Appendix C, the relative impact of competitive pressure on E-HRM usage is the moderate ($\beta = -0.16$, $p<0.01$) compared with the other independent variables in the proposed model. It meant the general working in the industries force the organisations to emerge with E-HRM, unexpectedly, but

higher pressure of HR activities management lead to lower level of E-HRM usage in organisations of Bangladesh. A reason could be financial constraint of organisations in Bangladesh, especially local organisations. Because of low IT investment businesses are unable to fulfil the needs - using IT application for HR activities- of HR managers. Regarding the E-HRM exploitation, the objectives of using E-HRM for HR activities are more on effective and efficient HR management. Therefore, when HR managers put on pressures to the company regarding E-HRM and related IT facilities, and if the companies are unable to meet the demand (due to financial constraints), these lead to inefficiency of HR managers.

The results of previous research in developed nations like North America (Sila, 2013), New Zealand (Al-Qirim, 2008), United Kingdom (Ramdani et al., 2013; Gutierrez et al., 2015) and European Union (EU) countries (Oliveira & Martins, 2010) validate the finding of this study. Moreover, the results of research conducted in developing nations such as China (Bian, 2012), Iran (Ghobakhloo et al., 2011), India (Gangwar et al., 2015), Jordan (Al-Dmour, 2014), Malaysia (Chong & Chan, 2012), Saudi Arabia (Askool & Nakata, 2012), Taiwan (Low et al., 2011; Lin, 2014) and Thailand (Sophonthummapharn, 2009) support the finding of the current study. Consequently, the present result confronts the finding of the studies such as England (Alshamaila et al., 2013), Indonesia (Rahayu & Day, 2015), Korea (Jeon et al., 2006), Malaysia (Ahmad et al., 2014; Ahmadi et al., 2015), Portugal (Oliveira et al., 2014), Singapore (Teo et al., 2007) Taiwan (Pan & Jang, 2008; Lian et al., 2014), United Arab Emirates (Aboelmaged, 2014) where researchers reported competitive pressure as an non-significant factor in adoption of IT applications.

5.3.1.9 The Relation between E-HRM Usage and Organisational Performance

In looking at the factors determining E-HRM usage and its influence on organisational performance, E-HRM usage was being tested to function as dependent variable (when assessing factors to E-HRM usage), independent variable (when looking

at the relationship between E-HRM usage and organisational performance) (Figure 5.1). And, indirect relationship between E-HRM usage and organisational performance was also examined through a mediating variable – job satisfaction of HR personnel.

In prior studies, researchers argued the impact of IT usage in firm performance or organisational performance (Delone & McLean, 1992; Sadiq et al., 2013). Weill (1992) suggested that technology's impact on organisational performance may be mediated through another variable such as usage. Therefore, a mediating variable – job satisfaction of HR personnel – was used to examine the indirect effect of E-HRM usage on organisational performance.

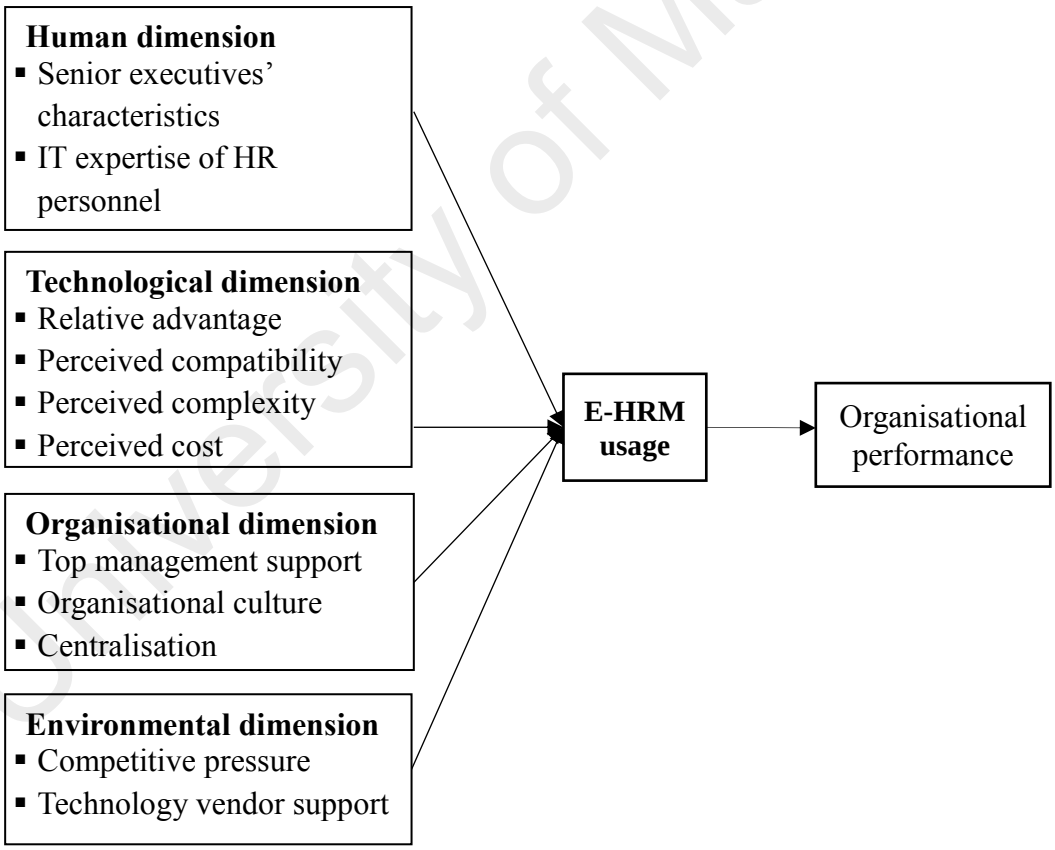


Figure 5.1: Conceptual Model without Moderator and Mediating Variable

Here, structural model 2 (Figure 4.17) was considered instead of structural model 1 (Figure 4.16) to identify the relation between E-HRM usage and organisational

performance. Because, a mediating variable – job satisfaction of HR personnel - was included in structural model 1 to check the influence of the mediator on "E-HRM usage – organisational performance" relationship. The functions of E-HRM usage was tested as dependent and independent variable. As discussed before, eleven factors (selected independent variable) influenced E-HRM usage for which 81.9 % (Appendix C) of variations in usage were explained. On the other hand, E-HRM usage was not the mediator of business performance as its value of direct effect, 0.592 was larger than the value of direct effect. However, a significant linear relationship (β=0.592, $p<0.000$) could be seen between E-HRM usage and organisational performance. So, the finding of the above study supports the suggested hypothesis H12 that a positive relationship between E-HRM usage and organisational performance. So, this study is found to provide empirical evidence that E-HRM usage significantly influence organisational performance. The prior research argued that IS/IT application has a significant impact on organisational performance (Gardner et al. 2003; Ruël & van der Kaap, 2012; Sadiq et al., 2013; Salwani et al., 2009). The present finding is consistent with the result of previous research on developed and developing nations.

Results suggested that E-HRM usage and business performance were closely linked. The findings reflected firm's planning in enhancing E-HRM technology utilisation. In other words, findings suggested that firms should start looking towards E-HRM investment without delay. Besides, external parties such as the government and industry associations should take part in encouraging E-HRM investment. Awareness campaign and availability of E-HRM incentives could provide support to the firms.

5.3.2 Non-significant Variables

5.3.2.1 Relative Advantage as a Factor to E-HRM Usage

Observing at factors to E-HRM usage, the finding of the above study does not back up the suggested hypothesis H3. With a significant negative path, relative advantage was found to be statistically non-significant factor in the research model. As can be seen in Appendix C, its impact on E-HRM usage is not significant ($\beta = -0.005$, $p = 0.074$). This implies that relative advantage of E-HRM is not influential to the adoption decision in organisations of Bangladesh. To surprise, this result does not support the finding of previous studies on the adoption of IT applications in different settings. One possible explanation could be the relative advantage of E-HRM has not been properly perceived by most of the companies in Bangladesh (Chowdhury et al., 2013), whether they adopt E-HRM or not. However, one potential reason of these non-significant relationships would be the possibility of indirect effects among variables in predicting E-HRM usage.

Unfortunately, this result is inconsistent with the outcomes of studies conducted in Western nations like England (Ramdani et al., 2013), New Zealand (Al-Qirim, 2008), Portugal (Oliveira et al., 2014), and in Asian developed country - Korea (Jeon et al., 2006). More notably, the result of this research shows inconsistency with what was found basing on the prior research done on developing nations like United Arab Emirates (Aboelmaged, 2014), Malaysia (Ahmadi et al., 2015; Chong & Chan, 2012), Jordan (Al-Dmour, 2014), Iran (Ghobakhloo et al., 2011), Taiwan (Low et al., 2011; Lin, 2014), Indonesia (Rahayu & Day, 2015), Singapore (Teo et al., 2007), Thailand (Sophonthummapharn, 2009), Hong Kong (Ngai & Wat, 2006) and India (Gangwar et al., 2015). On the other hand, the present result supports the earlier adoption research in China (Bian, 2012), Taiwan (Lian et al., 2014), Jordan (Al-Mobaideen et al., 2013) and United Kingdom (Gutierrez et al., 2015).

5.3.2.2 Perceived Complexity as a Factor to E-HRM Usage

Perceived complexity was hypothesised H5 to be in a negative relationship with E-HRM usage. The hypothesised correlation was not backed up. It meant an organisation HR practices in the industry force the organisations to adopt E-HRM, but higher complexity in IT applications lead to lower level of E-HRM usage in organisations of Bangladesh. As can be seen in Appendix C, its impact on E-HRM usage is not significant (β = -0.033, p = 0.233). This implies that perceived complexity is not a significant factor for E-HRM usage in organisations of Bangladesh. A possible explanation maybe nowadays, in Bangladesh most people are under the age of 40. This millennium generation has been growing up with all sorts of IT facilities, and expects their workplace being utilised with IT applications. They have more or less acquired the knowledge and skills on computers and internet, and they are familiar with computer operations. In this IT era, currently various information systems are utilised in companies and other software are quite user-friendly, and are easy and convenient to work with. However, the experience they have concerning the other systems that are present at the organisation may lower people's thoughts on how complicated the E-HRM may seem to be. Therefore, it appears that most people do not think E-HRM is hard to learn or is complicated to use. Therefore, complexity of E-HRM is not regarded as an influential factor to E-HRM using among organisations of Bangladesh.

Surprisingly, this finding does not echo the results obtained in previous studies on developed and developing nations such as Australia (England & Stewart, 2007), England (Ramdani et al., 2013), India (Gangwar et al., 2015), Jordan (Al-Dmour, 2014), Malaysia (Chong & Chan, 2012), Portugal (Oliveira et al., 2014), Taiwan (Lian et al., 2014) and United Kingdom (Gutierrez et al., 2015). But the finding supports the outcomes of some studies conducted on various IT innovation in developing nations, that found significant relationship between perceived complexity and IT applications

adoption, especially in the Asian region like Malaysia (Ahmad et al., 2014; Ahmadi et al., 2015), Singapore (Teo et al., 2007), Taiwan (Low et al., 2011), and China (Bian, 2012), also in some Western nations such as England (Alshamaila et al., 2013), New Zealand (Al-Qirim, 2008) and North America (Sila, 2013).

5.3.2.3 Technology Vendor Support as a Factor to E-HRM Usage

What was found according to this study supported the suggested hypothesis H11 that a posotive relationship exists between technology vendor support and E-HRM usage. As can be seen in Appendix C, the relative impact of technology vendor support on E-HRM usage is ($\beta = 0.057$, $p = 0.346$) that is not significant compared with the other independent variables in the proposed model. This means that technology vendor support did not predict E-HRM usage in the organisations of Bangladesh. One possible explanation is that senior management of organisations of Bangladesh sees that what they expect from the E-HRM applications is done commendably by the vendors since they that technical and training campaigns are done accordingly, they are prone to the adoption of the E-HRM. Another thing is that local organisations usually developing their own E-HRM applications because of financial constraint. They might be perceived that in-house development of E-HRM was cheaper than vendor's one.

This finding seems to relate with the outcomes of studies carried out in developed as well as developing nations like the New Zealand (Al-Qirim, 2008), Brazil (Costa et al., 2004), Malaysia (Ahmadi et al., 2015) and Indonesia (Rahayu & Day, 2015). More notably, the result of this research shows inconsistency with the outcomes of the previous research done in some developed and developing nations like England (Alshamaila et al., 2013), Iran (Ghobakhloo et al., 2011), Jordan (Al-Dmour, 2014), Taiwan (Chang et al., 2007) and Thailand (Sophonthummapharn, 2009) where technology vendor support was identified as a significant factor in respective settings.

5.3.3 Job satisfaction of HR Personnel as a Mediating Variable

Observing the mediating effect of job satisfaction of HR personnel on "E-HRM usage-organisational performance" relationship, the finding of this study supports the proposed hypothesis H14. To test whether the variable mediates the relationship three conditions were checked suggested by Midgley (2011). At first, an independent variable is supposed to influence the mediator (H13a). Secondly, the independent variable is also supposed to influence the dependent variable (H13b). Third, when you include the mediator in the dependent and independent variable relationship, the predictive power must decrease (H12).

According to what was found on this study, there was the support of the suggested hypothesis H13a that there exists a positive relationship of the E-HRM usage and job satisfaction of HR personnel. As can be seen in Appendix C, the relative outcome of E-HRM usage and job satisfaction of HR personnel was ($\beta = 0.749$, $p<0.001$) that is statistically significant. Again, it was found that job satisfaction of HR personnel had significant positive relationship with organisational performance ($\beta = 0.419$, $p<0.001$). Finally, observing the structural model 2 (Figure 4.17) where the mediating variable was excluded, the relative outcome of the E-HRM usage on the organisational performance is positive and the value of β is 0.592, $p<0.001$. So, the result supports the hypothesis H12. But, looking at structural model 1 where mediating variable was included (Figure 4.16), it was observed that the relative effect of E-HRM usage on the organisational performance is positive and the value of β is decreased as 0.275, $p<0.001$ (Table 14/Table 17). Consequently, the type of mediation is partial. Since, the immediate effect of the E-HRM usage on organisational performance is still significant after this moderating variable (job satisfaction of HR personnel) include into the structural model 1 (Figure 4.16), even though β is reduced.

The finding is consistent with earlier research where this construct was used as a mediating variable to investigate its mediating effect on the relationship of HR personnel's E-HRM using attitude and turnover intention. Numerous research attested that employee turnover affect the organisational performance. So, this construct (job satisfaction of HR personnel) was chosen for this study and found partial mediation influence on the existing correlation of E-HRM utility as well as organisational work. The final result indicate that apart from the economic and effects for the organisations that are intended and talked about in the previous research (Strohmeier, 2007) ,the E-HRM also has outcomes in relation to work regarding the staff that work daily in the organisation. The influence can actually be recognised basing on the satisfactory work the staff offers as well as the intentions of turning over. The available results show that implementing the E-HRM is seen as useful, ease of use and the best for the HR staff with the condition of satisfaction on the job as a compulsory E-HRM context change. This is consistent with Bondarouk and Ruel (2009), that raised an alarm for the investigation of a particular E-HRM stakeholder called HR employees, and Elkins and Philips (2000) who assured the importance of considering the HR staff thoughts during E-HRM implementation.

Moreover, the outcome further indicates that the work done is not satisfactory and leads to the decrease of the overall organisational performance. This is considered as a threat to the job. Thus, the unsatisfactory cases imply consequences that are not intended on the E-HRM implementing in organisations. In case an organisation fails to create a positive E-HRM image then the HR staff are not satisfied. In this scenario, it is therefore seen that there are many occurrences of the negative rather the positive impacts which result to the down fall of the organisation (Maier et al, 2013). This can be explained by a closer examination of the influence of an E-HRM on an employee's daily work: the streamlining and efficiency brought about by the E-HRM may only last

a short period of time as the employees get used to the system. Negative effects such as changing work routines or HR identities, however, are long-lasting. Consequently, these negative experiences decrease satisfaction and increase turnover intention. Both are detrimental to the objectives of the organisations.

However, Weill (1992) suspected that technology's impact on organisational performance may be mediated through another variable. This finding fills the gap of knowledge ensuring that usage of E-HRM impact on organisational performance is partially mediated through job satisfaction of HR personnel (a mediating variable).

5.3.4 Business Experience with E-HRM (years) as a Moderating Variable

Research findings demonstrated that experience in E-HRM plays a significant role as a moderator in the "E-HRM usage - organisational performance" relationship. This was evidenced by 1 percent increase in R^2 value of business performance. As supported by Kauffman et al. (2002), the trial and error process experienced by a firm as a result of E-HRM implementation would benefit the firm by gaining experience on what strategies paid off and what did not. Applying evolutionary game theory approach, Kauffman et al. (2002) found that through exploration, experimentation, examination of market feedback and performance feedback, and the learning process based on others' experiences would enable firms to realise what worked better and what did not. These supported the finding on why "E-HRM usage - organisational performance" relationship was moderated by business experience with E-HRM.

5.3.5 Summary of Key Findings

In summation, the study met the general objectives, finding out the things determining E-HRM usage on organisational performance of the manufacturing and service industry in Bangladesh. All four unique aims were responded to as follows:

In finding out how far the factors categorised as technological, organisational and factors affecting the environment influenced the E-HRM usage at organisational level, eight variables were found to significantly influence E-HRM usage (human dimension - senior executives' characteristics and IT expertise of HR personnel; technological dimension – perceived compatibility and perceived cost; organisational dimension – top management support, organisational culture and centralisation; and for environmental dimension – competitive pressure). In structural model 3 (final model), the R^2 for E-HRM usage was 83.1%, indicating that all the (independent) variables understudied contributed to about 84% of the variance explained in E-HRM usage.

In determining the nature of "E-HRM usage - organisational performance" relationship, E-HRM usage was found to have significant positive relationship with organisational performance.

In examining whether job satisfaction of HR personnel acts a mediator between "E-HRM usage - organisational performance" relationship, job satisfaction of HR personnel partially mediates the relationships between E-HRM usage with organisational performance.

In Figure 4.16 (structural model 1), determining whether business experience with E-HRM (years) moderated the "E-HRM usage - organisational performance" relationship, business experience with E-HRM was found to moderate the relationship, evidenced by an increase of R^2 of organisational performance from 50.6 percent to 51.6 percent (1 percent increase in R^2, $p<0.001$).

Moreover, this study assisted to condense the available knowledgeable niches and promoted important information and outlines that facilitated E-HRM usage in the Bangladeshi business environment by answering the questions of the research.

The first research question on factors of E-HRM usage, the evidence of the study has a final verdict that eight variables that include: senior executives' characteristics, IT expertise of HR personnel, perceived compatibility, perceived cost, top management support, organisational culture, centralisation and competitive pressure were found to be significant factors of E-HRM usage.

In research question (ii) E-HRM usage was found to have significant influence on business performance.

Research question (iii) that examined whether job satisfaction of HR personnel acts as the mediation on correlation of the E-HRM usage and the organisational performance, it was found that the relationship was partially mediated by job satisfaction of HR personnel.

Research question (iv) that examined whether business experience with E-HRM influenced "E-HRM usage - organisational performance" relationship, it was found that the relationship was moderated by business experience with E-HRM.

5.4 Contribution to New Knowledge – Academic Literature

The study results indicated various crucial methodological and empirical contributions that appear in the paragraphs below:

The study developed an integrated conceptual framework for the factors that influence the organisation's decision to adopt E-HRM (Figure 5.2). Data analysis in chapter 4 established eight factors (senior executives' characteristics, IT expertise of HR personnel, perceived compatibility, perceived cost, top management support, organisational culture, centralisation and competitive pressure) to significantly influence E-HRM usage. In looking at how usage influenced business performance, results found that higher usage led to higher performance. The post implementation

effect of E-HRM was investigated by adopting HR personnel's job satisfaction as a mediating variable. Finally, the test on moderator influence of business experience with E-HRM on the "E-HRM usage -organisational performance" relationship found that business experience with E-HRM moderated the relationship.

A significant methodological factor in producing the new information in this study was the use of a multidimensional E-VALUE model (Figure 3.1) for E-HRM that explained the potential factors of E-HRM usage and the impact of E-HRM at organisation level. The E-VALUE structure mainly comprised of a collaborative model; TOE framework, HOT-fit model, evolutionary game theory, TAM, and RBV theory. Therefore, putting the variables and making a test of them in one model has promoted a visible picture as well as multidimensional suggestions regarding the testing of the casual relationship of the variables. The E-VALUE model was developed based on extensive literature reviews in order to answer all four research questions as discussed in section 5.2 above, bridging the gap in knowledge.

This study offers the methodology to measure the constructs. Here, multiple approaches were used to analyse the data and several models were examined at the same time. Furthermore, this study proposes a more accurate methodological process in its clear definition of the underlying constructs. Assessments of the reliabilities and validities of each construct using CFA confirm the relationship between both empirical and theoretical concepts. Therefore, by combining these methodologies with the purified measurement items, this study paves the way for the future empirical research into E-HRM framework.

Finally, from an extensive literature review an important niche from the E-HRM literature was pointed out, which is insufficient research regarding the potential factors for E-HRM usage and outcomes of the E-HRM on the operation of the organisation

from a key HR managers' point of view. Here potential variables i.e. senior executives' characteristics (innovativeness and IT knowledge) and organisational culture that could have important influence on E-HRM usage or adoption decision have been identified in contrast to previous researches. Empirical proof from this study suggests that senior executives' characteristics (innovativeness and IT knowledge), and organisational culture are significant factors for E-HRM usage or managerial adoption decision. This research is one of the few that studies E-HRM adoption factors according to the key points of HR leaders in determining the business value derived from the E-HRM application.

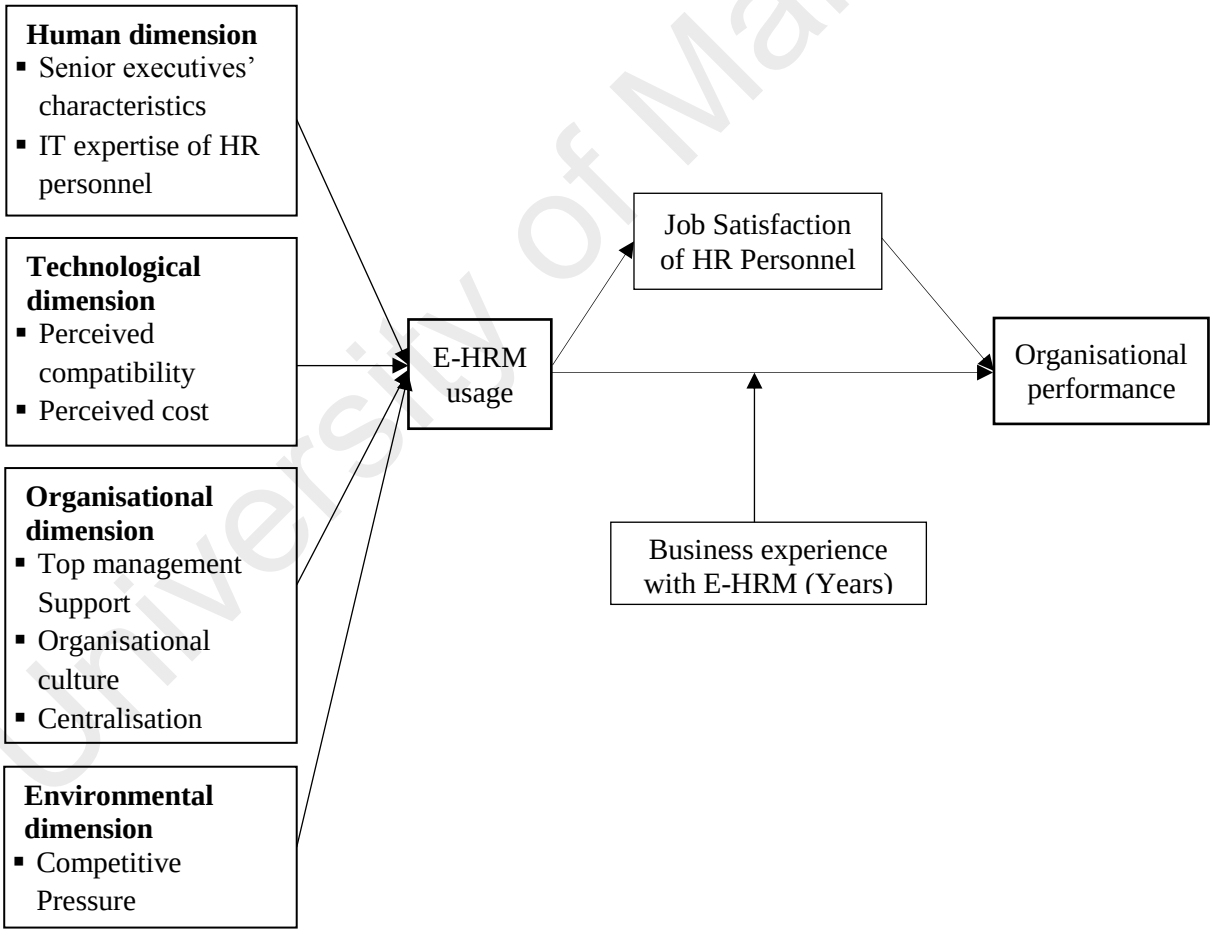


Figure 5.2: Proposed E-VALUE Model – Significant Contribution to Academic Literature

5.5 Closing the Gaps

All four objectives of the study were met. Research findings significantly contributed to the organisations of Bangladesh regarding E-HRM potentials and knowledge advancement. E-VALUE model usage in the current study had established its applicability regarding E-HRM issues. Empirical evidences from the current E-HRM usage companies provided a multidimensional views and outcomes of E-HRM usage. The introduction of additional significant variables, consideration of mediating effect, consideration of moderator effect, and the use of multidimensional indicators in measuring organisational performance have made E-VALUE model a more comprehensive and multidimensional theoretical model in evaluating the usage of the E-HRM as well as the value creation in the organisations in Bangladesh.

Generally, the application of the suggested E-VALUE framework in evaluating the issues that determine E-HRM usage on organisational performance combined to narrow the gaps in the previous studies as shown in Table 5.2:

Table 5.2: The Application of E-VALUE Structure in narrowing the gaps in the knowledge areas basing on the previous research studies

Niches in the previous studies in relation to E-HRM usage and value creations	*Application of the E-VALUE structure in narrowing the gaps present in previous researches.*
1. The missing of important dimension; Human dimension that includes senior executives' characteristics and IT expertise of HR personnel on E-HRM usage decision that could have important influence on E-HRM usage.	1. TOE framework and HOT-fit model were integrated to develop four dimensional factors of E-HRM usage. *Findings*: Both variables (senior executives' characteristics and IT expertise of HR personnel) of human dimension were found significant for E-HRM usage.

Table 5.2 continued: The Application of E-VALUE Structure in narrowing the gaps in the knowledge areas basing on the previous research studies

Niches in the previous studies in relation to E-HRM usage and value creations	*Application of the E-VALUE structure in narrowing the gaps present in previous researches.*
2. Missing of potential variables; senior executives' characteristics (innovativeness and IT knowledge) and organisational culture (as the proposals in other literature concerning IT innovation) that could have important influence on E-HRM usage.	2.Senior executives' characteristics (innovativeness and IT knowledge) and organisational culture were included in the study. *Findings:* Senior executives' characteristics and organisational culture were found to have significantly influenced E-HRM usage.
3. The lack of a moderating effect that may have a strong tangential effect on the correlation of E-HRM usage and the overall performance of the organisation.	3. A moderator variable (business experience with E-HRM) was included to see if its inclusion could change the original relationship between E-HRM usage and organisational performance. *Finding:* Business experience with E-HRM was discovered to moderate the relationship between E-HRM usage and organisational performance.
4. The absence of mediator effect, which could have a strong tangential effect on the relationship between E-HRM usage and organisational performance.	4. A mediating variable (Job Satisfaction of HR Personnel) was included to assess its effects on the original relationship between E-HRM usage and organisational performance. *Finding:* Job satisfaction of HR personnel partially mediates the relationships between E-HRM usages with organisational performance.
5. The measurement of organisational performance for E-HRM usage was absent in E-HRM past literature. Prior studies stated that the relationship between the applications of HRIS/E-HRM and the organisational performance is still uncovered (Bhuiyan et al., 2015). Moreover, Marler & Fisher (2013) made reviews of that relate to HRIS/E-HRM applications as well as organisational performance since 1999 to 2011 and no valid proof was gotten from the relationships that were stated.	5. The measurement attributes were adopted based on nonfinancial perspectives as a comprehensive and multidimensional performance measurement tool. Organisational performance was measured following Katou and Budhwar (2006) instrument. Finding: The findings report a highly positive relationship between E-HRM usage and organisational performance. Uni-dimensionality test using confirmatory factor analysis had shown a good fit of single model (with an adaptation of 6 nonfinancial items) in assessing organisational performance.

5.6 Practical Implications of Research Findings

The current study has crucial implications for HR practitioners:

First, this study elaborated IT-based HRM applications, which can be applied in every aspect of HR functions (such as recruiting and selecting, the training offered as well as developing the payroll , the benefits available and compensation, HR plans and finally the internal and external passing of information and self-services of the staff), which provides a better understanding about the influence of potential factors of using the E-HRM, the importance of using the E-HRM and post implementation effect (HR employees' reaction) to the entrepreneurs and decision makers in the organisations of Bangladesh. The findings will enable them to implement the necessary changes in the organisations. Decision-makers are supposed to be informed of the issues that have impacts in the adoption and implementation of applications of the E-HRM and its effect, in that they can have enough time for preparation in case there arise any problems regarding IT innovations and implementation.

Second, managers of HR are supposed to play a role in the support of implementation of the E-HRM in the organisations. They must have the potential to convince the high level authority on the importance of having the implementation of E-HRM for them to allocate proper time as well as the budget needed for the implementation. Moreover, the commitment of the highest level of management is very important in terms of support as well as making sure that resources are present for the adoption project, not forgetting the development of human capabilities featured by the presence HR knowledge, IT as well as communication skills

Third, the results recommend that companies using E-HRM are supposed to know the differences in cultures. Firms that have plans of adopting E-HRM must make sure that there is open learning, coordination and as well as a supportive culture to be present

in the organisation. When an organisation has these cultural attributes then the E-HRM implementation will increase.

Fourth, the results indicate that by ensuring the practicality and user-friendliness of the system, an organisation can increase job satisfaction and improve organisational performance and makes the likelihood of voluntary E-HRM usage as higher as possible.

Fifth, the study put together all the database of all companies present in Bangladesh which use the systems of E-HRM. Now, various important agencies in both governmental and non-governmental areas make references to this particular database. Furthermore, the use of this database, the vendors of E-HRM are able to view the potential market. Moreover, an organisation that seeks in the adoption of a system of the E-HRM can refer to these companies.

Sixth, worldwide providers of E-HRM software are supposed to be keen in the application guidelines regarding the implementation of the systems of the E-HRM which have been successful. The research is beneficial to the worldwide ERP vendors whose aim is to search for emerging markets.

Seventh, the kind of experiences from the research is beneficial to other developing nations that have the same cultural, political as well as the economic environments, that could be applicable in the North Africa region and the Middle East, just to name a few.

Lastly, the government ought to consider helping organisations in the adoption of E-HRM application. Other related agencies include Ministry of Posts, Telecommunications & Information Technology, the Ministry of Planning, the Ministry of Science and Technology, the Ministry of Information, and the Ministry of Public Administration in Bangladesh in promoting ICT regulatory model providing financial

resources and other services from the government is beneficial to such as engaging in training programs that involve the adoption of applications of E-HRM.

5.7 Limitations of Current Study

There are some limitations are identified:

First, this study was on one specific country, Bangladesh and the first of such attempt in the country. However, it may be applicable in similar country culture in South Asia region though not generalisable.

Second, only private (local and foreign) organisations of Bangladesh were considered in this study. There was no public organisations data according to the samples that were collected. Moreover, analysis of the data was seen to be cross-sectional. According to all cross sectional studies, the parameter appears to be more of static and rather dynamic. This kind of drawback limits the general findings of the study and the unique population that was used to gather the data.

Third, insufficient literature on E-HRM research done in Bangladesh was the main limitation of this study. No particular research has ever been conducted on the determinants of E-HRM usage at organisational level and its impact on organisational performance. As a consequence, the researcher experienced many problems. For example, there was totally no single source that could indicate the companies using the E-HRM in Bangladesh were not known during the period the questionnaires were being issued out.

Fourth, IT applications usage in different business functional area is increasing and consequently, senior managements should realise the multidimensional benefits of E-HRM usage. This study only concentrated on the organisational decision to use E-HRM, but not on related issues for E-HRM implementation. Therefore, researchers can

further focus on the implementation issue of E-HRM, looking into the influence of determinants on each stage of implementing E-HRM.

Fifth, E-HRM usage impacts on organisational performance were determined by the usage of subjective and perpetual measures given the constraints in obtaining the actual data from those companies using E-HRM but demonstrated to be the best as shown by previous researchers (Chien et al., 2007; Nah et al., 2008).

Sixth, due to time and financial constraints, it was not possible for researchers to personally conduct all questionnaires, which result in several respondents did not completely answer the questionnaires as expected, and some questionnaires were not sent back in time.

Seventh, this study only applied eleven factors to examine the usage decision, and there are also many other potential determinant factors that may affect E-HRM usage at organisational level. Other potential issues were not included in the research framework since there was insufficient literature and lack of empirical evidence. Moreover, the questionnaire has many pages inclusive of the critical factors that cause an increase in its length. As a consequence, the possibility of participation refusal among the respondents..

Finally, the various types of the packages of E-HRM that are used by engaging organisations, the size of the companies using them, their section of the industry, the kind of ownership or even there was no control variable. There are a limited number of E-HRM using companies in Bangladesh. If the study concentrated on the control variables, the number of respondents would have been reduced. However, to account for differences among the organisation, the companies who participated must have been using E-HRM for at least the last three years.

5.8 Future Research

Since a few empirical studies have examined the potential factors of E-HRM usage and its impact on organisational performance in developing nations, there exists many loop holes for expansion of this research as well as future research.

First, consideration on larger sample size from private and public organisations in future research could help to provide clearer understanding on the relationships among variables.

Second, the final results of the research could be generalised if it could be replicated in other countries such as in North Africa, South East Asia, Middle East and Latin America. This may facilitate deeper insights regarding the adaption of innovation and the use of the firm as well as cultural information.

Third, this research employed subjective measures of E-HRM usage and its impact on organisational performance. It is expected that using objective measures for evaluating E-HRM usage may produce diverse outcomes from the findings from this study. There is a suggestion to the potential researchers to put in practice certain quantifiable measures . The quantifiable measures may be actual versus anticipated budget of the E-HRM project, the actual versus the estimated E-HRM project time, operational efficiencies like reduction in cycle time, increased market income, and return on investment on the E-HRM project.

Fourth, this study only applied eleven factors to examine the usage decision, and there are also many other potential determinant factors that may affect E-HRM usage at organisational level, such as pressure from trading partners (Ahmad et al., 2014; Lin, 2014; Gutierrez et al., 2015), formalization of system development and management (Chau & Tam, 1997), data security (Hung et al., 2015) and government policy

(Troshani et al., 2011; Al-Dmour, 2014; Ahmadi et al., 2015), information intensity (Thong, 1999; Wang et al., 2010; Ghobakhloo et al., 2011). These potential determinant factors can be examined by future research so as to better explain the organisational decision to usage E-HRM.

Fifth, the studies in future may employ the research model to analyse the effects of various brands of the software of E-HRM, the dimension of companies that have adopted the E-HRM, the kind industries as well as the firm's ownership on implementing the E-HRM.

Sixth, inclusion of other moderating variables such as industry sector, IT investment and E-HRM implementation stage (Clear understanding of strategic goals, experimentation, integration, and competitive advantage stages) could provide more interesting findings.

Seventh, future studies could comprise other mediating variables such as E-HRM capabilities, IT capabilities, and customer value to examine their moderating effect on the existing correlation between the usage of E-HRM and the performance of the organisation.

Eighth, further analysis could be done on the potential relationship between non-significant factors that could have the possibility of establishing indirect relationships in predicting E-HRM usage.

Lastly, the research utilised a survey methodology and cross-sectional sample to collect samples of data. Various research methods cand be employed that include case studies to provide comprehensive insights in the future. Longitudinal study is recommended for which organisational performance would be best measured over time.

5.9 Chapter Summary

In this chapter, the summary of the research is explained. The chapter gives a description of the findings of both significant and non-significant variables of the current study to address objectives and research questions of the study. It discusses the important contribution to new knowledge in academic literature. Additionally, it addresses the practical implications of the findings of the research, limitations of the study and provides suggestions for future research.

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LIST OF PUBLICATIONS AND PAPERS PRESENTED

Journal Papers:

1. Masum, A. K. M., Beh, L. S. (2017). An Integrated Model for Identifying the Factors of the E-HRM Usage and its Impact on Organisational Performance. Accepted at *International Journal of Economic Perspectives*. [Scopus]
2. Masum, A. K. M., Beh, L. S. (2017). E-HRM Usage and Organisational Performance: Examining the Mediating Effect of Job Satisfaction of HR Personnel. Accepted at *International Journal of Economic Perspectives*. [Scopus]
3. Masum, A. K. M., Beh, L. S. (2017). Determinants of Electronic Human Resource Management (E-HRM) Usage and its Impact on Organizational Performance. Submitted to *Global Business Review*. [Scopus]
4. Masum, A. K. M., Beh, L. S. (2017). E-HRM Usage and Organisational Performance: Examining the Moderating Effect of Business Experience with E-HRM. Submitted to *Management Research Review*. [Scopus]
5. Masum, A. K. M., Beh, L. S., Hoque, K. E., & Azad M. A. K. (2018). Intelligent Human Resource Information System (i-HRIS): A Holistic Decision Support Framework for HRM. Published at *International Arab Journal of Information Technology (IAJIT)* [January 2018, No. 1] [ISI-Q4]

Conference Papers:

1. Masum, A. K. M., Beh, L. S. (2015). *Factors affecting the decision to adopt human resource information system (HRIS) in hospitals: An exploratory study*. Presented at 14th APRU Doctoral Students Conference (DSC) hosted by Zhejiang University (ZJU), Hangzhou, China.