

CHAPTER 2 LITERATURE REVIEW

2.1 LITERATURE REVIEW

2.1.1 IT services and IT service management

A service is a change in the condition of a person, or a good belonging to some economic entity, brought about as a result of some other economic entity, with the approval of the first person or economic entity (Hill, 1977). From IT perspective, service is a provider-client interaction that creates and captures value (IBM Research, 2004). The area of service operations management has been established as a management field, span across other management disciplines like HR, marketing and operations (Chase, 1996).

From IT service management perspective, a service is “a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks” (OGC, 2008). Value is defined in terms of customer’s business outcomes as well as customer’s perceptions, and the value includes utility “fitness for purpose” and warranty “fitness for use” (OGC, 2008). The IT Service Management (ITSM) defines as employment of different service management frameworks to seek governance and service maturity.

Business processes are strategic assets when they create competitive advantages and market differentiation. These processes are complimented and supported by different type of resources such as people, knowledge, applications and infrastructure (OGC, 2007).

The origin of service management traced back to traditional service businesses such as airlines, banks, hotels and telephone companies. Its practice has grown adoption as service oriented IT organizations implement this to manage IT applications, infrastructure and processes. Solutions to business problems and support for business models, strategies and operations are increasing in the form of services. The popularity of shared services and outsourcing has contributed to the increase in the number of organizations who are service providers, including internal organization units. This in turn has strengthened the practice of service management, at the same time imposing greater challenges on it (OGC, 2007)

IT organizations are now recognizing that standards improve productivity, business/IT synergies and cost savings. Solutions implemented on standards direct organizations to achieve goals with less degree of risk. Standards provide ability to rapid integrate new hardware and software into existing infrastructure.

One of the major ITIL advantage is efficient and effective management of IT services and infrastructure with quality control. When the level of quality achieved, businesses are more confident to deploy new mission critical services.

2.1.2 Why ITIL/ITSM is needed?

IT service delivery accounted for 70–90% of total cost of IT ownership (Fleming, 2005). Organizations are now acknowledging an opportunity to use IT service management standards to enhance competitiveness. Pressure is mounting on CIOs (Chief Information Officer) for rapidity of service delivery (Cash and Perlson, 2004). It has been estimated that 90% of United States companies have one or more service management processes implemented (Lynch, 2006).

IT service providers cope with a challenge to improve the quality of service by IT Service Management (ITSM) in highly complex IT environments. This pressure demands strong collaboration from both external and internal service providers (Yan, Shen and Chen, 2010). McBride (2009) suggested that there is a shift in IT focus from technical artifacts to customer directed services. The mounting adoption of IT best practices is impelling with a requirement to manage the quality and reliability of IT services (ITIG, 2008). Efficient management of IT services has been positioned as a critical factor to the success of enterprise strategy.

As the role of services continue to increase in the global economy, effective IT management transformed into a competitive advantage for service providers. Different standards with structured approaches for delivering value and managing risk with governance functions have been developed.

The transformation from a technology oriented IT department to a client focused IT service provider can only be guaranteed by service oriented IT management (Hochstein and Brenner, 2005). According to (Wu Yin, 2009), an organization IT capability should be seen as an integral tool for creating economic value instead of a business infrastructure that makes business operations efficient. Thus, a key issue for service providers is to determine how technology should be adopted which is acceptable and satisfactory to customers and service organizations (Walker, 2002).

Efficient and effective processes and knowledgeable employees are the key differentiators between high performing organizations from average or low performing organizations (Galup and Dattero, 2010).

Standards have historically evolved from the codification of existing practices that had achieved market dominance (Bonino and Spring, 1991). From technology operations to corporate strategies, IT standards are vital in organizations and IT is no more recognized as collection of hardware and software but positioned as a service provider. Technology functions are modeled, implemented and managed as services via management frameworks (ICS, 2007).

This is where IT Service Management (ITSM) plays a vital role. Improving delivery of IT services with structured processes has been a research topic over

the last few years (Mayerl et al., 2005; Bartolin, 2004). IT Service Management (ITSM) is about efficiently and effectively using and leveraging people, processes, products and partners (OCG, 2004). ITSM helps organizations in keeping pace with business needs while providing guaranteed level of service at optimized and predicted cost (Rainge and Perry 2004).

Information technology service management is a systematic process oriented approach for managing IT systems to deliver quality IT services. ITSM revolve around defining, managing, and delivering IT services with strategic alignment to support business goals and customer needs.

The concept of IT service management evolved from escalating complexity of IT systems and the growing maturity of IT management (Congar, 2008). IT service management models enable organizations to reduce cost and governance risks and facilitate smooth organization change management. ITSM achieve this service quality and cost efficiency by leveraging in different frameworks, for this research we are studying ITIL (Information Technology Infrastructure Library) which is a collection of best practices and guidelines to achieve IT service management.

IT service management standards such as ITIL are now important to organizations around the globe. These standards provide guidance and tools for effective management and control of IT service delivery (Cater-Steel and Wui

Gee, 2007). The major benefits of implementing ITIL are reduced costs, IT services aligned with business needs, a higher quality of delivery and enhanced customer satisfaction (OGC, 2007).

Addy (2007) stated typical benefits an organization can gain by implementing any ITIL Service management framework are

- Greater technology efficiency and quality IT service delivery
- Justification of cost with service quality
- Integration of process with service incorporated in the process DNA
- Service delivery aligned towards business, users and customer requirements.
- Clear identification of role and responsibilities in end to end service delivery cycle
- Measurable performance indicators and benchmarks
- Improvement of Service Management practices in the design stage of the Service Lifecycle.
- Increase productivity/operational efficiency and encourage the efficient use of resources
- Reduce resolution time/change implementation times
- Eliminate unnecessary/inefficient process steps
- Leverage unused capability (equipment and personnel)
- Enable IT employees to manage their workloads more effectively

- Improve customer service
- Improve the level of responsiveness to customer/user requests
- Improve user satisfaction
- Deliver improved access to IT products and services
- Enable the IT function to demonstrate its value
- Improve system stability
- Reduce incident volumes/unplanned outages/failed changes
- Minimize the effects of business impacting events
- Increase availability (service, hardware etc)
- Increase the dynamics of the IT function/infrastructure
- Provide a solid foundation for prevention based initiatives
- Improve the visibility of business processes
- Reduce costs
- Making the optimum purchasing decision
- Avoiding penalties
- Improve compliance and demonstrate corporate governance
- Provide reliable and accurate performance metrics
- Enable access to accurate real time data enables more effective management decision making
- Clearly allocate IT costs to the users of the services – Improved accountability
- Enforce best practice through systemized controls

OGC (2007) define service management is a set of specialized organizational capabilities for providing value to customers in the form of services, IT Service Management is concerned with the delivery and support of IT services that are appropriate to the business requirements of an organization.

The capabilities take the form of functions and processes for managing services over a lifecycle, with specializations in strategy, design, transition, operation, and continual improvement. The capabilities represent a service organization's capacity, competency, and confidence for action. The act of transforming resources into valuable services is the core of service management. Without these capabilities, a service organization is merely a bundle of resources that has relatively no value for customers (OGC, 2007).

2.1.3 ITIL (IT Infrastructure Library) – A global standard for IT Service

Management

The information technology infrastructure library (ITIL) is a global de-facto framework for IT Service Management (ITSM). ITIL is a set of best practices for managing IT Service Management and technology delivery process

In late 1980, the United Kingdom Central Computer and Telecommunications Agency (CCTA) developed ITIL framework to lower cost and efficient management of IT service delivery (Salle, 2004).

ITIL was published between 1989 and 1995 by Her Majesty's Stationery Office (HMSO) in the United Kingdom on behalf of the Central Communications and Telecommunications Agency (CCTA); now refer as Office of Government Commerce (OGC).

There are similarities between ITIL and ISO 9000 standards for quality management. ITIL provides a comprehensive, consistent and coherent set of best practices and processes for IT Service Management, promoting a quality approach to achieve business effectiveness and efficiency in the use of information systems (OGC, 2007).

ITIL (Information Technology Infrastructure Library) is a set of books that contain processes, best practices and guidance on how organizations can manage the support and delivery of IT services to internal and external users. Due to organizations increasing dependence on IT to run their businesses and deliver corporate goals, ITIL framework methodologies emerged as a key aspect of IT management. ITIL improve service delivery by addressing core issues such as problems, incidents, changes and request management.

ITIL has been accepted globally as set of best practices and guidelines. ITIL outline extensive set of management procedures that support businesses to achieve both quality and value in IT operations.

IT Infrastructure Library (ITIL) is widely adopted and accepted (Wagner 2006). Any organization which adopts ITIL can expect to achieve a large range of benefits. The major benefits are reduced cost, effectiveness and efficiency of IT services. Other benefits include service tailored to business needs with improved customer satisfaction (OGC, 2006). To date, ITIL is the only comprehensive, non-proprietary, publicly available guidelines.

ITIL is supported by a comprehensive qualification scheme, accredited training organizations with implementation and assessment tools. ITIL is a vendor or product independent framework available freely in public domain.

ITIL Infrastructure Library documents are industry best practice guidance. Being a framework, ITIL describes the contours of organizing IT Service Management in an organization. The model show the goals, general activities, inputs and outputs of the various processes, which can be incorporated within IT organization (OGC, 2007)

Cater-Steel and Wui Gee (2006) reported evidence that many organizations are also adopting other frameworks such as Control Objectives for Information and related Technology (COBIT), Capability Maturity Model Integration (CMMI) and ISO 9001 (Quality Management System). In these organizations, ITIL offer something that has been missing to close the gap with other management best practices such as COBIT.

ITIL enable organizations to effectively manage governance aspects. IT governance is an integral part of enterprise governance. IT governance consists of organization leadership, organization structure and processes that ensure organization's IT sustain and extend organization's strategy and objectives (Salle, 2004).

ITIL Service Strategy focuses on how to transform service management into a strategic asset (Bajada, 2008). Service transition help to manage and control IT service changes implemented in the working environment of a company (SkillSoft, 2006).

2.1.4 ITIL Adoption and implementation progress

Cater-Steel and Wui Gee (2007) established that many public and private sector organizations in Australia have adopted ITIL and making substantial progress in implementing the framework. Large organizations, especially with large IT workforce are leading the implementation.

Since ITIL is a set of best practices and standards, the framework recommends no standards for the sequence of implementation process. By inducing such elasticity, ITIL implementation is transformed to a strategic management domain. Factors such as organization size, IT organization size and other organizational factors started to play very important role in ITIL implementation. This research is about assessing these factors and their influence in ITIL implementation.

According to the survey conducted by itSMF Asia (IT Service Management Forum), ITIL V2 is the most commonly adopted framework in Asia (54%), followed by ISO/IEC 20000 (25%). Projects currently in progress are primarily implementing either ISO 20000 or ITIL v3.

Cater-Steel and Wui Gee (2006) reported that senior management commitment and sufficient ITIL funding were the most critical ITIL implementation success factors in Australian organizations. Effective change management, existence of an ITSM champion, team commitment, sufficient allocation and provision of ITIL

training to IT staff were identified as other success factors (Cater-Steel and Wui Gee, 2008). According to Tainter (2006), there is a clear trend emerging in the IT industry to adopt best practice framework ITIL.

ITIL adoption is increasing in Australia, North America and other countries (Barton, 2004). Murray et al. (2007) reported that organizations are getting major benefits from ITIL implementation as ITIL enabled them to react in a swift manner to address business needs.

IT Service Management Forum (itSMF) has published the statistics on what kind of saving an organization can expect from ITIL implementation (IT Service Management Forum, 2004), these are

1. Over 70 percent reduction in service downtime.
2. ROI up by over 1,000 percent.
3. Savings of £100 million per annum.
4. New product cycles reduced by 50 percent.

2.1.5 ITIL – No one size fits all solution

ITIL exemplify best practices, but it does not stipulate or constrain solutions. ITIL recognizes that there is no one size fits all solution to the design and implementation of processes for the management and delivery of IT services. ITIL framework provides a structured approach to the processes involved in IT service management and service delivery. It does not matter if it is an internal IT organization or external service provider, each organization should adopt the guidelines, principles, and concepts of ITIL to suite their organization context (ITSMF, 2004).

Several studies indicated that level of ITIL awareness across the world is elevating (Hochstein, 2005). However, findings reported by Cater-Steel and Wui Gee (2005) that only 56% of 108 companies surveyed in Australia felt that ITIL implementations had met or exceeded their expectations.

The ITIL Library has the following components (OGC, 2007):

- 1) The ITIL Core: best practice guidance applicable to all types of organizations who provide services to a business.

- 2) The ITIL Complementary Guidance: a complementary set of publications with guidance specific to industry sectors, organization types, operating models, and technology architectures.

The ITIL Core consists of five publications. Each provides the guidance necessary for an integrated approach as required by the ISO/IEC 20000 standard specification:

- 1) Service Strategy
- 2) Service Design
- 3) Service Transition
- 4) Service Operation
- 5) Continual Service Improvement.

Service Strategy: The Service strategy volume provides guidance on how to design, develop, and implement service management not only as an organizational capability but also as a strategic asset. Guidance is provided on the principles underpinning the practice of service management that are useful for developing service management policies, guidelines and processes across the ITIL Service Lifecycle (OGC, 2007)

Service Design: OGC, 2007 defines service design as “The Service Design volume provides guidance for the design and development of services and

service management processes. It covers design principles and methods for converting strategic objectives into portfolios of services and service assets. The scope of Service Design is not limited to new services. It includes the changes and improvements necessary to increase or maintain value to customers over the lifecycle of services, the continuity of services, achievement of service levels, and conformance to standards and regulations. It guides organizations on how to develop design capabilities for service management”.

Service Transition: The Service Transition volume provides guidance for the development and improvement of capabilities for transitioning new and changed services into operations. This publication provides guidance on how the requirements of Service strategy encoded in Service design are effectively realized in Service operation while controlling the risks of failure and disruption (OGC, 2007)

Service Operations: OGC (2007) defines service operations as management of service operations. It includes guidance on achieving effectiveness and efficiency in the delivery and support of services so as to ensure value for the customer and the service provider. Strategic objectives are ultimately realized through service operations, therefore making it a critical capability

Continual Service Improvement: OGC (2007) defines instrumental guidance in creating and maintaining value for customers through better design, introduction,

and operation of services. It combines principles, practices, and methods from quality management, Change Management and capability improvement

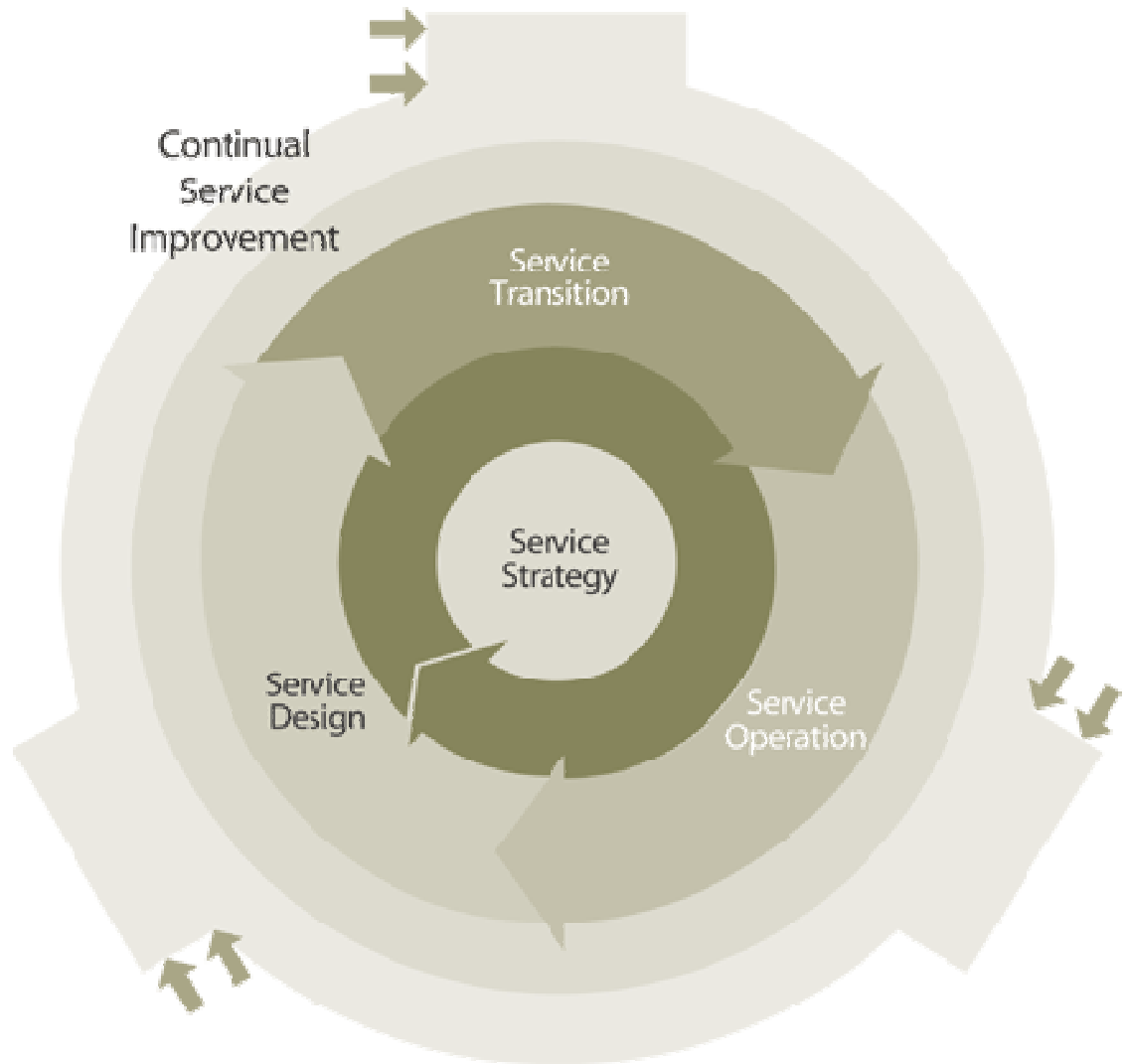


Figure 2.1: ITIL Core Publications (OGC, 2007)

2.1.6 ITIL Processes

OGC (2007) define the following set of processes in ITIL (version 3)

1. Service Strategy

- Demand Management
- Strategy Generation
- Service Portfolio Management
- IT Financial Management

2. Service Design

- Service Level Management
- Service Catalog Management
- Capacity Management
- Availability Management
- Service Continuity Management
- Information Security Management
- Supplier Management

3. Service Transition

- Transition Planning and Support
- Change Management
- Release and Deployment Management
- Service Asset and Configuration Management

- Service Validation and Testing
- Evaluation
- Knowledge Management

4. Service Operation

- Event Management
- Incident Management
- Request Fulfillment
- Problem Management
- Access Management

5. Continual Service Improvement

- Service Measurement
- Service Reporting
- Service Improvement (The Seven-step improvement Process)

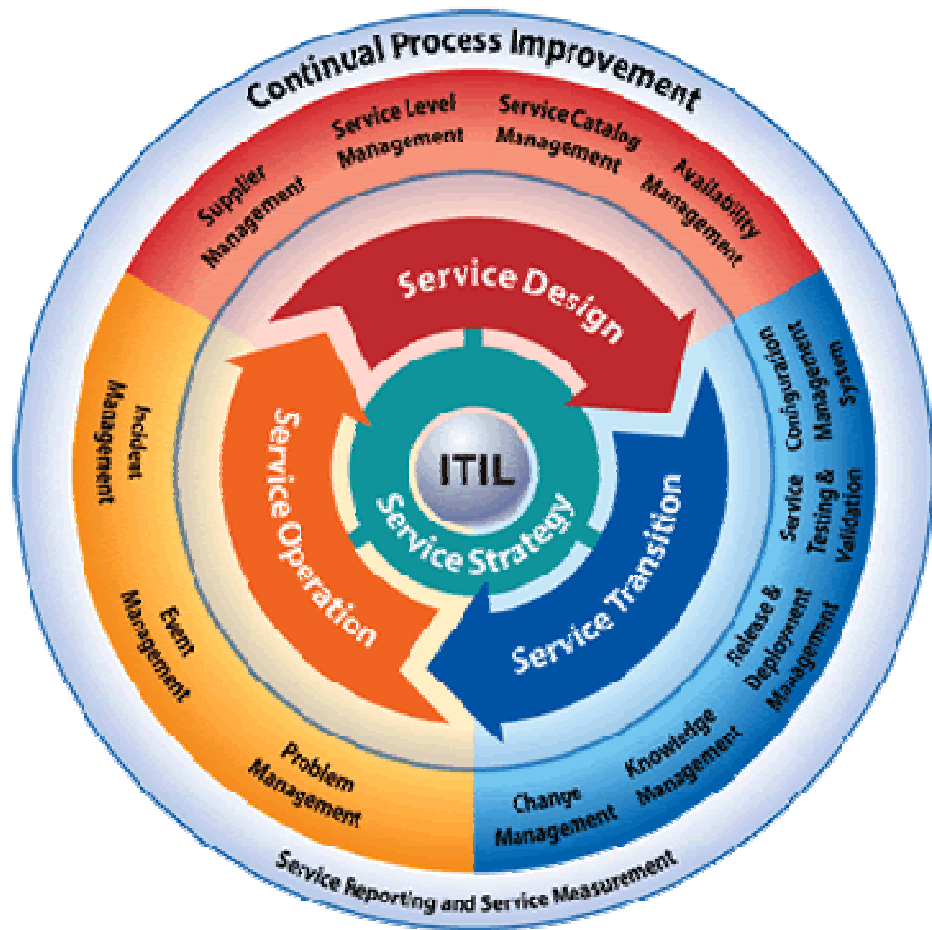


Figure 2.2: ITIL Processes and Service life cycles (ISO consulting, 2009)

2.1.7 ITIL Core Streams, Processes and Functions

ITIL Core Stream				
Service Strategy (SS)	Service Design	Service Transition	Service Operation	Continual Service Improvement (CSI)
<ul style="list-style-type: none"> • Service management • Service life cycle • Service assets and value creation • Service provider types and structures • Strategy, markets and offerings • Financial management • Service portfolio management • Demand management • Organizational design, culture and development • Sourcing strategy • Service automation and interfaces • Strategy tools • Challenges and risks 	<ul style="list-style-type: none"> • Balanced design • Requirements, drivers, activities and constraints • Service-oriented architecture • Business service management • SD models • Service catalogue management • Service level management • Capacity and availability • IT service continuity • Information security • Supplier management • Data and information management • Application management • Roles and tools • Business impact analysis • Challenges and risks • SD package • Service acceptance criteria • Documentation • Environmental issues • Process maturity framework 	<ul style="list-style-type: none"> • Goals, principles, policies, context, roles and models • Planning and support • Change management • Service asset and configuration management • Release and deployment • Service validation and testing • Evaluation • Knowledge management • Managing communication and commitment • Stakeholder management • Configuration management • Challenges and risks • Asset types 	<ul style="list-style-type: none"> • Balance in SO • Operational health • Communication • Documentation • Events, incidents and problems • Request fulfillment • Access management • Monitoring and control • Infrastructure and service management • Facilities and data centre management • Information and physical security • Service desk • Technical, IT operations and application management • Roles, responsibilities and organizational structures • Technology support to SO • Managing change, projects and risk • Challenges • Complementary guidance 	<ul style="list-style-type: none"> • Goals, methods and Technique • Organizational change • Ownership • Drivers • Service level management • Service measurement • Knowledge management • Benchmarks • Models, standards and quality • CSI seven-step improvement process • Return on investment (ROI) • Roles • Authority matrix (RACI) • Support tools • Implementation • Governance • Communications • Challenges and risks • Innovation, correction • Best practices supporting CSI

Table 2.1: ITIL Core Topics, ITGI, (2008)

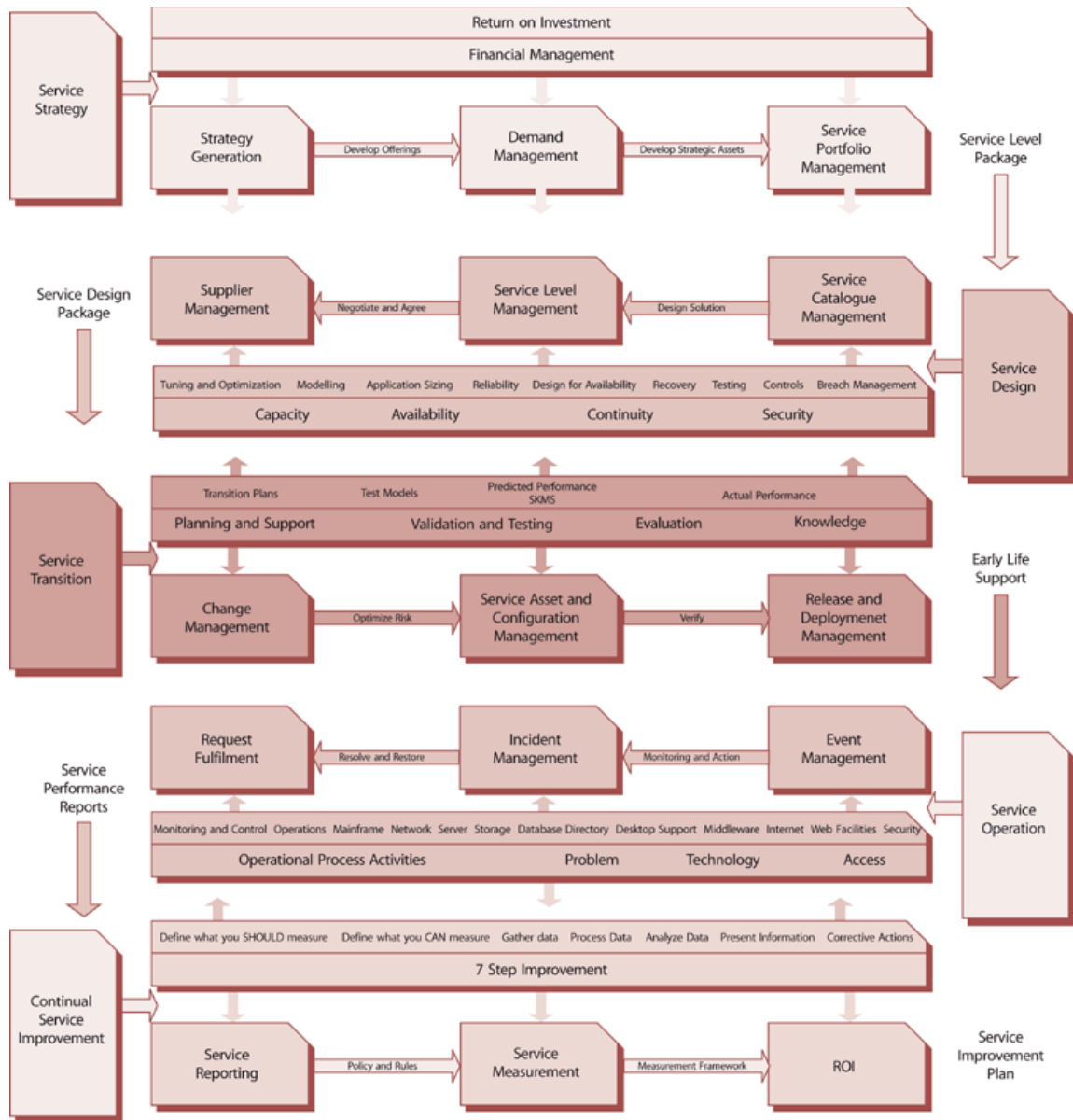


Figure 2.3: ITIL Process interactions (ACM, 2006)

Hochstein et al. (2005) reported that one of the major benefits from ITIL is improved quality of IT services which is only made possible due to elevated efficiency, standardization, process optimization and transparency via continuous process monitoring.

Cater-Steel and Wui Gee (2006) reported that organizations in Australia, United Kingdom and New Zealand realize the TIL benefits which varies from enhanced IT service management focus to efficient management of IT infrastructure. Toleman et al (2009) studied the relationship and link between IT governance and ITSM.

2.1.8 Other management framework implementation with ITIL

Although ITIL is widely adopted de-facto standard for IT service management (Salle 2004, Hochstein et al., 2005), various other IT service management frameworks complimenting ITIL are available, some of these are

1. MOF (Microsoft Operations Framework)
2. IBM SMSL (Systems Management Solution Lifecycle)
3. COBIT (Control Objectives for Information and related Technology)
4. ISO/IEC 38500 Corporate Governance of IT
5. ISO 9001 Quality Management
6. ISO/IEC 15504 (Process Assessment Standard)
7. ISO/IEC 19770 (Software Asset Management)
8. ISO/IEC 27001/AS 7799 (Information Security Management)
9. SEI CMMI (Software Engineering Institute: Capability Maturity Model Integration)

(OGC, 2007) stated that ignoring public frameworks and standards can needlessly place an organization at a disadvantage. Organizations should nurture their own knowledge on top of a body of knowledge based on public frameworks and standards.

According to OGC (2007), ITIL is closely related to a number of other frameworks and standards. These are ISO/IEC 2000 and the ISO/IEC 27001. Cater-Steel and Wui Gee (2006) reported that organizations are adopting ITIL concurrently with other frameworks such as COBIT, CMMI and ISO 9000.

ITIL is also related to IT Governance framework Control Objectives for Information and related Technology (COBIT). In a joint effort, ITGI (IT Governance Institute) and OGC (Office of Government Commerce, United Kingdom), with the support of itSMF (IT Service Management Forum), published a document that provides a general overview and mapping between COBIT, ITIL and ISO 17799 standard (ITGI and OGC, 2005). In addition, ITIL is related to Project Management methodologies such as Projects in Controlled Environments (PRINCE2) and Project Management Body of Knowledge (PMBOK). Other related methodologies include Software Engineering Institute's Capability Maturity Model Integration (CMMI).

ITIL delivers and supports a set of ten interrelated IT service management (ITSM) processes and one function. It exemplifies the roadmap and description of ITSM practices, which are comprehensively covered in the services support

and delivery sections of the library set. ITIL is an evolving and complex framework with many intermingling factors and confounding effects.

Cater-Steel and Wui Gee (2005) reported evidence that organizations are implementing multiple frameworks (COBIT, CMMI, ISO 9001) with ITIL framework in Australia.

	ITIL	COBI	CMMI	ISO 9001
Focus	IT service management and operations	IT governance and control	Software development process improvement	Generic quality management system
Target	IT service providers	All organizations	Software development organizations	All organizations
Documentation	Set of books providing best practice guidelines	Hierarchy of control objectives organized in four domains	Detailed guidelines on process areas, goals and practices	Family of standards providing requirements and guidelines for certification
Process Improvement	An early version of ITIL CMM is available	Weak on process improvement as it is essentially a control framework	Framework is devoted to process improvement	ISO 9004 provides high level guidance for process improvement

Table 2. 2 Cater-Steel, Tan, Toleman (2006), List of processes included in ITIL, COBIT 9001 frameworks (Summarized from Curtis, 2005; Garbani, Koetzle, & Powell, 2005; ISO, 2005b; Lucid IT, 2005; Mingay & Brittain, 2003).

2.1.9 ITIL Implementation success factors

There is not enough academic literature available to investigate success in ITSM field (Cater-Steel and Wui Gee, 2007). However, literature is available in successful implementation of ERP. Potgieter (2005) concluded that both customer satisfaction and operational performance improve as ITIL processes implemented. Many researchers support the critical success factors (CSF) approach to assess IT project successful implementation (Rui, 2007; Plant, 2007; Holland, 1999).

Cater-Steel and Wui Gee (2005) compiled a list of success factors from the literature connecting to successful IT/ERP project implementations and developed a research instrument. This research instrument was employed to study ITIL implementation progress from 2005-2009 at itSMF Australia National Conference to gauge practitioner perceptions about importance of ITIL success factors. These factors includes

1. Involvement of business staff in ITSM/ITIL implementation project.
2. Sufficient funding for ITSM / ITIL initiative.
3. Effective change management for user/customer.
4. Commitment from senior management
5. ITSM training provided for IT staff
6. Understanding of business needs
7. Sufficient allocation of IT staff to ITSM implementation.

8. Champion to advocate and promote the ITSM framework
9. Ability of IT staff to adapt to change
10. Documentation and integration of processes.

Vathanophas (2007) reported that implementer differed in their choice of implementation strategies. An organization adopts ITIL frameworks but fail to implement it successfully may face deteriorated level of service quality with degradation of IT performance.

Organizations need to clearly understand the factors which influence and shape the successful ITIL implementations.