The Capability Model for IT-enabled Outsourcing Service Providers

Volume I: Overview

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Abstract

Organizations are increasingly delegating their information technology-intensive business activities to external service providers, taking advantage of the rapid evolution of the global telecommunications infrastructure. The business processes being outsourced range from routine and non-critical tasks, which are resource intensive and operational, to strategic processes that directly impact revenues. IT-enabled outsourcing services include IT-intensive business processes, projects and tasks that use Information Technology as an enabler for designing services, coordinating service deployment, and delivering services. Managing and meeting client expectations is a major challenge in IT-enabled outsourcing services and examples of failure abound. Failures typically happen throughout the outsourcing process, i.e., during requirements specification, contract execution or service completion.

The eServices Capability Model (**e**$^{\mathbf{scm}}$) contains a set of practices that address the entire outsourcing process, and seek to aid IT-enabled outsourcing service providers to form, manage and improve outsourcing relationships. Each practice in the **e**$^{\mathbf{scm}}$ is associated with a capability level. The five capability levels in the **e**$^{\mathbf{scm}}$ describe an improvement path that progresses from a minimal level of having the capability to deliver a service that meets client requirements up to the highest level of enhancing value through continuous innovation.

Volume I of this Technical Report provides an overview of the **e**$^{\mathbf{scm}}$. To learn more about the practices, see Volume II, Technical Report CMU-CS-01-163, which provides detailed descriptions of each practice in the **e**$^{\mathbf{scm}}$.

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Keywords: benchmarking, service provider's model, quality models and systems, capability models, business process outsourcing, IT enabled outsourcing services, IT enabled services, outsourcing models, eServices Capability Models.

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Preface

The Information Technology Services Qualification Center (IT^{sqc}) within Carnegie Mellon University's (CMU)[1] Institute for Software Research, International (ISRI), is in the School of Computer Science. CMU has a strong research track record in quality modeling, for example, the Capability Maturity Models for Software and People[2], e-Commerce Capability and eBusiness Maturity Model[3] (eMM), and business management models[4]. IT^{sqc}'s mission is to address the emerging need for capability models and certification methods for organizations involved in the evolving Internet economy. The IT^{sqc} presently envisions three capability-modeling and certification efforts:

- **eServices Capability Model** (e^{scm})[5] – to provide IT-enabled outsourcing service providers with a reference model and appraisal methods to improve their capability to consistently deliver high quality services in the networked economy. The model and methods will aid service providers in establishing, managing and continually improving relationships with clients.
- **eSecurity Capability Model** – to develop methods to certify organizations who are adopting effective practices that protect against denial of service, privacy invasion, virus detection, content protection, and other security threats in the evolving Internet economy.
- **eCommerce Capability Model** – to enable organizations to improve critical capabilities to effectively execute eCommerce operations and to appraise and certify their capabilities.

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[1] www.cmu.edu

[2] Software Engineering Institute (SEI)

[3] ISRI and the Graduate School of Industrial Administration (GSIA)

[4] GSIA

[5] e^{scm} is for the IT-enabled service providers. In 2002 a client side model for IT-enabled outsourcing will be forthcoming

CMU is creating partnerships and an IT^{sqc} consortium involving leading international corporations in the development of these Capability Models. For the **e^{scm}** effort, Satyam Computer Services Limited (NYSE: SAY),[6] is the founding partner in this global consortium. SAY is a diverse end-to-end IT solutions provider and one of India's leading IT organizations.

Volume 1 of this document is comprised of eight sections. The first section is an Executive Summary. Sections II – VIII are the Model Overview beginning with II) an introduction to IT-enabled outsourcing and the need for a capability model to address its specific issues; III) background information about outsourcing and business opportunities in the IT-enabled outsourcing service sector; IV) a detailed description of the **e^{scm}** intent, development approach, including critical issues in modeling and assessing IT-enabled outsourcing service capabilities, and a brief analysis of related process and system quality models; V) **e^{scm}** guiding principles, framework and Capability Levels; VI) the list of **e^{scm}** practices; VII) a short description of the methods used for capability determination; and, VIII) a summary of this overview document. Appendix A is a detailed matrix showing model coverage of the **e^{scm}** and other major quality models. A glossary of terms used in this document is provided in Appendix B. Appendix C provides a mapping of the **e^{scm}** principles and practices. A view of the practices by capability level is in Appendix D. Volume 2 provides Practice Descriptions for the model.

[6] www.satyam.com

I. Executive Summary

> Over each of the four years in Dun & Bradstreet's Barometer of Global Outsourcing, companies have reported that between 20% and 25% of all outsourcing relationships fail in any two-year period. Half of the relationships will fail within five years. The reasons cited for failure are remarkably similar across all types of relationships. Nearly 70% of the respondents note that the outsourcing supplier 'didn't understand what they were supposed to do' and 'the cost was too high and they provided poor service.'[7]

In the last few years organizations, driven by increasing competitive pressures, are delegating one or more of their information technology-intensive business activities to an external service provider. In spite of reported problems, more than 30% of the organizations that have already outsourced one business process are actively searching for additional outsourcing opportunities in other areas.[8] The business processes being outsourced range from routine and non-critical tasks, which are resource intensive and operational in nature, to strategic processes that directly impact revenues. The rapid evolution of the global telecommunications infrastructure, and the increasing availability of bandwidth, has facilitated the design and delivery of outsourcing services from geographically distributed locations. Outsourcing service providers can now support multiple global outsourcing relationships, providing significant cost and quality benefits to their clients.

According to McKinsey & Co.[9], information technology-enabled outsourcing services are expected to grow fifteen-fold by 2008, and within the next 20 years are expected to grow to over a trillion dollars, with an increasing number of services using

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[7] Ozanne, M.R. (February 29, 2000). Barometer of Global Outsourcing - The Millennium Outlook, *Sponsored by Dun & Bradstreet.* http://www.dnbcollections.com/outsourcing/bar1.htm.

[8] http://www.dnbcollections.com/qbarom.htm

[9] McKinsey (1999) Highlights of the NASSCOM, McKinsey Study report on IT enabled service segment, sponsored by the National Association for Software and Service Companies, India.

information technology (IT) as an enabler for performing activities including developing service designs, coordinating service deployment, and delivering services. Some examples of IT-enabled outsourcing service segments are remote customer interaction, data center management, application service providers, content management and human resources. These services can be provided to different market sectors such as healthcare, finance, and consumables.

IT^{sqc} Capability Modeling and Certification

The Information Technology Services Qualification Center (IT^{sqc}) is part of Carnegie Mellon University's (CMU's) Institute for Software Research International (ISRI) in the School of Computer Science. IT^{sqc}'s mission is to address the emerging need for capability models and qualification methods, e.g., certification for organizations involved in the evolving networked economy. The IT^{sqc} is developing three interdependent capability-modeling efforts: (1) eServices Capability Model (**e**$^{\mathbf{scm}}$)[10]; (2) eSecurity Capability Model; and, (3) eCommerce Capability Model (**e**$^{\mathbf{ccm}}$). This executive summary focuses on the eServices Capability Model (**e**$^{\mathbf{scm}}$) and its potential value for clients and service providers.

IT^{sqc} is creating partnerships and a consortium involving leading international corporate entities in the development of these Capability Models. For the **e**$^{\mathbf{scm}}$ effort, Satyam Infoway Ltd.[11], the leading e-business solutions and Internet infrastructure provider in India, is the founding partner in this global consortium. Current model development efforts are supported by Satyam Computer Services Limited[12], a diverse end-to-end IT solutions provider and one of India's leading IT organizations. For the eCommerce effort, IT^{sqc} is in a partnership with The Boeing Company and CMU's Software Engineering Institute (SEI).

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[10] **e**$^{\mathbf{scm}}$ is for the IT-enabled service providers. In 2002 a client side model for IT-enabled outsourcing will be forthcoming.

[11] www.sifycorp.com, (NASDAQ: SIFY)

[12] www.satyam.com, (NYSE: SAY)

The concept of outsourcing is not new. However, the frequently changing nature of IT-enabled outsourcing services, and the need for keeping in step with the emerging tools and expertise, introduce a higher level of complexity for service providers and presents risks for clients. The growing need to help clients determine a service provider's capability led IT^{sqc} to focus on this sector. The **e^{scm}** offers client organizations a means to select capable providers who are committed to delivering consistently high quality services and developing continually improving relationships. Also, we expect this model to provide guidance to service providers so they can more effectively manage IT-enabled outsourcing relationships.

e^{scm} Framework

The **e^{scm}** contains one hundred practices organized into three outsourcing phases (plus a category of practices covering the overall outsourcing process) and five organizational elements that are associated with successful outsourcing practices. Each practice is also associated with a capability level.

Phases

Existing models such as the International Standards Organization (ISO) and Malcolm Baldrige primarily focus only on the execution of a contract. The **e^{scm}** also addresses contract activities related to the design and deployment of an outsourced service and asserts that successful outsourcing necessitates a focus on two overlooked areas: (1) the activities leading to the formation of outsourcing relationships, and (2) the delivery, transitioning or termination of outsourced services. Thus, **e^{scm}** addresses activities critical to successful outsourcing not only in the contract execution phase, but also in the key precontract and postcontract phases of the outsourcing process.

Organizational Elements

In addition to attention to precontract and postcontract phases, successful outsourcing also requires the coordinated functioning of the organization across the

outsourcing process. The **e**^{scm} categorizes five Organizational Elements that are critical to successful outsourcing: Organizational Management, People, Business Operations, Technology, and Knowledge Management. The practices in **e**^{scm} address the role of these Organizational Elements across the phases of the outsourcing process.

Practices

The **e**^{scm} framework contains one hundred practices that address the critical capabilities for IT-enabled outsourcing services. These practices are defined as either Overall Practices or Phase-Specific Practices. Overall Practices are independent of the outsourcing phase and span the entire outsourcing process. Phase-Specific Practices are practices specific to an Organizational Element within each phase of the outsourcing process. Where applicable, the practices have been defined so as to be complementary, and compatible, with existing quality models such as those from the ISO, Baldrige, or the family of Capability Maturity Models.

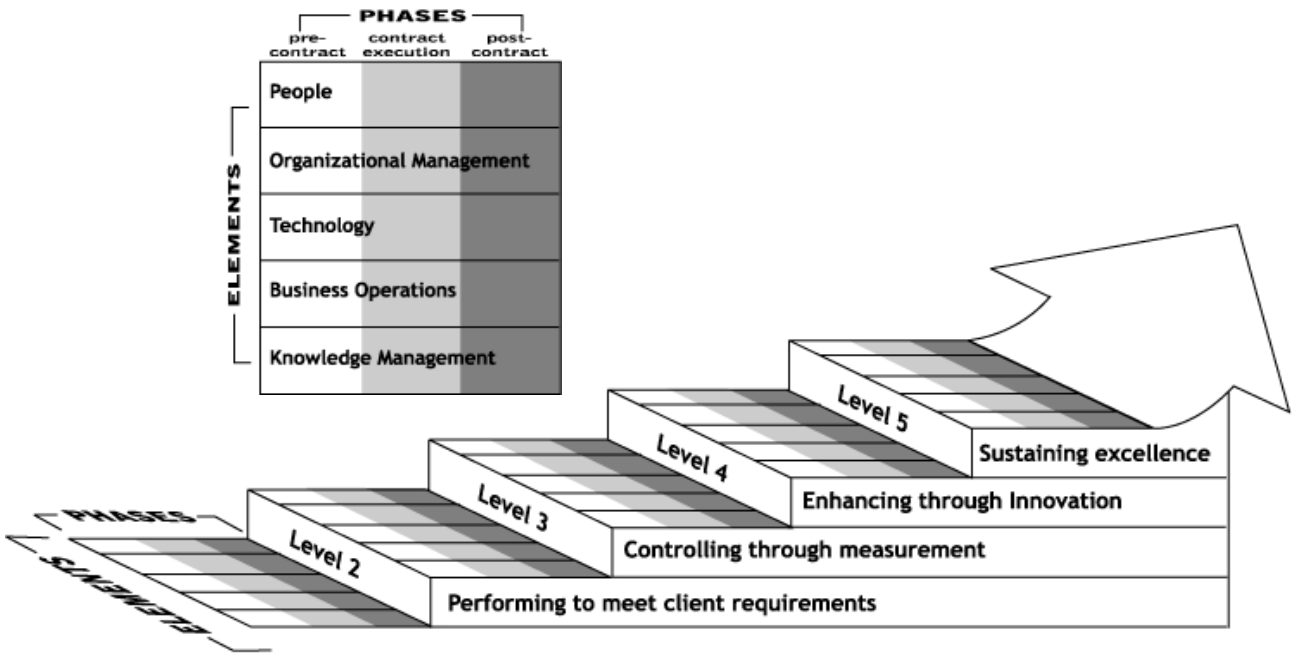
Capability Levels

The five Capability Levels of **e**^{scm} describe an improvement path that clients should expect service providers to progress along from a minimal level of having the capability to deliver a service that meets client requirements, up to the highest level of enhancing value through continuous innovation. The five levels of capability that define this path are:

Level 1 - Initial;
Level 2 - Performing to meet client requirements;
Level 3 - Controlling through measurement;
Level 4 - Enhancing through innovation; and,
Level 5 - Sustaining excellence.

Figure 1 shows the relationship of the phases, elements, and capability levels in the **e**^{scm} framework.

Figure 1: Overview of e^{scm} phases, elements, and capability levels.



At Level 1, service providers lack sound management practices. They operate without formalized systems and procedures, and even if a procedure has been specified it is not rigorously followed or enforced. Frequent crises, exceeded budgets and missed schedules are some of the other operational characteristics of such a service provider. Thus, service providers at the Initial level are often unable to effectively address their clients' requirements. Working with these organizations carries a high degree of risk and may eventually lead to the defeat of the very purpose of outsourcing: increasing financial benefits or adding business value.

At Level 2, a service provider has formalized procedures for capturing requirements and delivering the service per commitments made to clients. At Level 3, such a provider is able to continuously learn from experience, and measure and control its activities. A service provider at Level 4 is able to proactively respond to changes in the external or internal business environment, in addition to enhancing the capabilities gained at Level 2 and Level 3. A demonstrated ability to enhance value to stakeholders

and sustain capabilities at Level 4 for at least two years enables a service provider to achieve Level 5 – Sustaining Excellence.

e^{scm} - Appraisal and Evaluation Methods

The e^{scm} will be accompanied by evaluation and appraisal methods to identify, analyze and improve organizational capabilities. The e^{scm}-based evaluation method will enable clients to compare multiple potential providers with respect to the same capabilities, measured in a consistent manner. CMU-trained and authorized external agents will conduct evaluations of service providers. After a rigorous review of the evaluation data, CMU will issue a Certificate of Capability to qualified service providers. This evaluation method will aid in the analysis of the service providers' strengths, weaknesses and associated risks by measuring the extent of implementation and institutionalization of the practices defined in the e^{scm}. The appraisal methods also will enable service providers to determine their current capabilities and define targets for improvement.

A repository of data collected from participating organizations is being established at Carnegie Mellon's IT^{sqc}. The repository will provide status on state-of-the-art practices in IT-enabled outsourcing services, and may provide clients information on benchmark capabilities of service providers. It will also be used by IT^{sqc} to make changes, as necessary, to the e^{scm} to reflect the dynamic nature of the outsourcing industry.

The e^{scm} framework and initial certification method will be available from CMU so that Satyam Computer Services Limited and other select agents may use it to determine service provider capability in several IT-enabled outsourcing service segments prior to the end of 2001. For information about becoming a partner or member of the consortium please contact Dr. Jane Siegel at escm@cs.cmu.edu.

II. Introduction

The concept of allocating business activities to an outside organization in order to derive cost and quality benefits is not new to organizations; outsourcing[13] has been widely used since the mid-twentieth century. Initially outsourcing was used primarily for the manufacturing of industrial components, as well as for some non-critical services such as facilities management. Outsourcing in information technology (IT) commenced in the 1970s when organizations started to outsource parts of their IT operations to external service providers, in an effort to dramatically cut costs. Thereafter, the 1980's and 1990's witnessed the establishment of some landmark outsourcing agreements, which involved the shifting of entire IT operations to external service providers.

The rapid globalization of business, and the increased focus on core competencies in the late eighties and the nineties, also led organizations to extend the concept of outsourcing to IT-intensive business processes. These business processes included information services, logistics, human resource services, financial and payment services, and customer care. More recently, IT-intensive projects and tasks, including engineering services, geographical information systems, multi-media content development, and transcription services, are also being increasingly outsourced. The primary drivers for this trend are increasing competitive pressures, a need to access world-class capabilities, and a desire to share risks.

IT-intensive business processes, projects and tasks that are being outsourced currently range from routine and non-critical tasks, which are resource intensive and operational in nature, to strategic processes that directly impact revenues. The rapid evolution of the Internet and global telecommunication infrastructure has also provided organizations with a choice of service providers located anywhere in the world. Organizations that are outsourcing their business processes, projects or tasks are establishing 'extended' business partnerships with service providers, and are transforming themselves into 'extended enterprises'.

[13]Outsourcing "is an arrangement in which one company provides services for another company that could also be or usually have been provided in-house" [1].

IT-enabled outsourcing services include IT-intensive business processes, projects and tasks that use Information Technology as an enabler for designing services, coordinating service deployment, and delivering services. Some of the unique characteristics of IT-enabled outsourced services include service design and deployment activities that focus on designing the service delivery process, setting-up technology infrastructure, and developing or acquiring required skills. In addition, service delivery is continuous and repetitive and involves transitioning of service delivery infrastructure, including personnel.

Managing and meeting client expectations in outsourcing is a major challenge in IT-enabled outsourcing services, where the nature of the services themselves, and the rapid changes in technology and tools, introduce an additional level of complexity. Examples of failures in outsourcing relationships abound. Failures typically happen throughout the outsourcing process, i.e., during requirements specification, contract execution or service transition. The primary reason for failures is lack of defined service objectives and inadequate measurement of service related activities used to quantify and report progress. [14]

According to a recent Dataquest study, more than half (53%) of all outsourcing customers report having renegotiated a contract, and in nearly one-quarter of these renegotiations the original service provider lost the account. [3]

> Companies have reported that between 20% and 25% of all outsourcing relationships fail in any two-year period. Half of the relationships will fail within five years. The reasons cited for failure are remarkably similar across all types of relationships. Nearly 70% of the respondents note that the outsourcing supplier "didn't understand what they were supposed to do" and "the cost was too high and they provided poor service" according to Dun & Bradstreet's Barometer of Global Outsourcing. [5]

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[14] "There are hidden costs associated with outsourcing, with nearly 40% of the respondents in a survey indicated that their outsourcing bills are higher than expected. Initial bills exceeded the expected cost by at least 20% due to a low vendor estimate and/or an honest misunderstanding of the contract." [11]

"Risks associated with outsourcing include loss of control (31% of respondents of a Dataquest Survey), security and disaster recovery." [11]

Sufferings due to interruptions to delivery of service. [12]

In spite of the problems reported by many respondents, clients continue to plan to increase their outsourcing in the years beyond 2000. Over 30% of the companies presently outsourcing functions of their businesses are actively engaged in searching for outsourcing opportunities in additional functional areas. [5]

The large incidence of failures in outsourcing relationships and the continuing growth of IT-enabled outsourcing services led IT^{sqc} to focus on the effective management of outsourcing relationships and methods to determine and compare the capability of service providers. The eServices Capability Model (**e^{scm}**) provides IT-enabled outsourcing service providers a framework to improve their capability to deliver consistently high quality services and aids them in establishing, managing and continually improving relationships with their clients. The intent of the **e^{scm}** is to provide service providers with a set of best practices that enable them to effectively manage outsourcing relationships, and to provide clients with a way to assess and compare service provider's capabilities. The **e^{scm}** achieves this intent by focusing on the critical organizational attributes for people, technology and knowledge, and their applicability to the outsourcing process. The **e^{scm}** practices cover the entire outsourcing process from: 1) the activities leading to the formation of outsourcing relationships; 2) service design and deployment; 3) the delivery and enhancements of the outsourced services; to, 4) the transitioning of outsourced services to the client during contract completion or termination.

By grouping these practices in increasing levels of capability, the **e^{scm}** describes an improvement path for a service provider, from a minimal level of having the capability to deliver services that meet client requirements that are similar in nature, to the highest level of enhancing value to a client through innovation. The five levels of capability that define this path are: Level 1 - Initial, Level 2 - Performing to meet client requirements, Level 3 - Controlling through measurement, Level 4 - Enhancing through innovation, and Level 5 - Sustaining excellence.

The **e**$^{\mathbf{scm}}$ will be accompanied by multiple appraisal and evaluation methods to identify, analyze and improve organizational capabilities. The **e**$^{\mathbf{scm}}$ -based method(s) will enable service providers to determine their current capabilities and define targets for improvement. These methods will also enable clients to systematically and consistently compare multiple potential providers. The **e**$^{\mathbf{scm}}$ methods will help determine a service provider's capabilities by systematically analyzing the extent of implementation and institutionalization of **e**$^{\mathbf{scm}}$ practices. These methods will also aid in the identification of strengths, weaknesses, and associated risks during the formation, management, and expansion of outsourcing relationships, both for the service providers and for their clients.

III. IT-enabled Outsourcing Services - Background

The Extended Enterprise

Organizations that outsource (hereafter referred to as 'clients') have realized the importance of concentrating on core competencies,[15] and have thus established extended business partnerships with other organizations. These extended enterprises are looking beyond geographical boundaries to derive cost and quality benefits by forming outsourcing relationships with service and business infrastructure providers (hereafter referred to as 'providers'). These providers have as their core competencies the business processes, functions, or specific activities that are outsourced by the extended enterprise.

According to Peter Drucker, "in 10 to 15 years organizations would be outsourcing all functions that are support rather than revenue producing in order to lower their overall operating costs and improve service delivery" [4]. The strategic factors that drive organizations to outsource are those that have a direct impact on a company's overall marketplace position including:

- corporate re-engineering to focus on core business functions;
- increasing employee and management demands for service;
- increasing regulatory and compliance requirements due to organizations operating across geographical boundaries;
- accessing world-class capabilities;
- sharing risks; and
- increasing cost pressures.

In addition to these strategic factors, there are tactical and transformational reasons for outsourcing as well. Tactical reasons include infusing cash into business operations and reducing and controlling operating costs. Transformational reasons

[15]According to Gary Hamel and C.K. Prahalad "The key sources of advantage are to be found in management's ability to consolidate corporate-wide technologies and skills into competencies that empower individual businesses to adapt quickly to changing opportunities. Thus core competencies are the collective lessons learned in an organization, especially how to co-ordinate diverse skills and integrate multiple streams of technologies" [3] p. 81.

include responding to shorter product life cycles, reducing the risk of entering new markets, and leapfrogging competitors.

The Dun and Bradstreet Global Business Process Outsourcing Barometer [5] released in February 2000, revealed that:

> Worldwide expenditures on outsourced services will grow more than 25% from 1999 levels. Much of this growth will be found in Europe and Asia where outsourcing is being adopted with the same enthusiasm seen in the United States in the early and mid 1990s. In Europe, outsourcing expenditures will top $250 billion over the next twelve months up from $195 billion in 1999. In Asia, the market for outsourcing will top $300 billion. While outsourcing in North America represents 40% of global outsourcing, this percentage is down markedly from the levels shown in the first D&B Barometer of Global Outsourcing in 1997. At that time, outsourcing in North America represented slightly more than 60% of all world outsourcing. Outsourcing activities continue to broaden globally. As outsourcing's reach broadens, some dramatic patterns are emerging. Outsourcing appears to have a defined development pattern. Companies first outsource in areas like manufacturing where cost considerations are paramount. Later companies broaden their outsourcing activities into functions where there is no reason to have expertise such as facilities management and information services maintenance. [5]

PricewaterhouseCoopers sponsored the Global Top Decision-Makers Study on Business Process Outsourcing (BPO) in 1999. The study was a comprehensive report of global trends and developments in BPO.[16] It revealed that:

> Nearly two thirds (63%) of the top decision-makers interviewed said their companies had outsourced one or more business processes to external organizations and, two-thirds (66%) of the executives believed that BPO

[16]The study was conducted by the market research firm, Yankelovich Partners, which interviewed senior executives at 304 of the world's largest companies in 14 countries [6].

helped their companies become more profitable, leading to improved shareholder value. [6]

According to Dataquest's [7] 1999-2004 market forecast for Business Process Outsourcing (BPO),[17] the BPO market is experiencing record growth. The report states that:

> Worldwide, BPO services[18] are expected to grow from $207.7 billion in 1999 to $543.5 billion in 2004, with a Compounded Annual Growth Rate (CAGR) of 21.2 percent. At present, Logistics, Human Resource and Financial/payment services contributes the largest portion of the BPO market. Sales, marketing and customer care (which includes database and customer analysis, telesales/telemarketing, customer care, web sales and web marketing, others), and finance and accounting have been identified, as high potential areas for being outsourced by 2004. [7]

Outsourcing Contexts

Outsourcing relationships can be grouped into three broad contexts based on the analysis of what activity or group of activities is being outsourced by a client. These are: process outsourcing; project outsourcing; and task outsourcing.

Process outsourcing – an entire business process of the client is outsourced and the control of the process is transferred to the provider. For example, payroll outsourcing may involve the complex stage of transitioning the entire process including resources like computers, personnel, software, applications, etc., to a provider; or

Project outsourcing – a sub-set of activities in a business process of a client (e.g., installing IT infrastructure, new product design, software development for specific applications) can be outsourced to a provider, while the client retains

[17]Dataquest defines BPO as the delegation of one or more IT-intensive business processes to an external provider that, in turn, owns, administrates and manages the selected process/processes, based upon defined and measurable performance metrics.

[18]Not including manufacturing services, the BPO market is valued at $106.7 billion in 1999, growing at a 23.1 percent annual growth rate, and is expected to reach $301 billion in 2004.

control of the business process. A project has a definite end-date that is typically the date of delivery of the required service; or

Task outsourcing – a task within a business process of a client or a project is outsourced to a provider when: the demand for the task is intermittent; the task does not warrant allocation of internal resources by the client; and, there is unplanned high demand for the task that cannot be met by the client's internal resources. Some examples of tasks include training, transcription services, or temporary staffing.

The rapid evolution of the Internet and the increasing availability of bandwidth have facilitated the formation of extended enterprises. In the networked economy, organizations may be located at geographically dispersed locations. As a result service providers can now serve multiple outsourcing relationships, leading to significant cost and quality benefits to clients. This ability to extend past geographical boundaries has contributed to the growth of IT-enabled outsourcing services.

IT-enabled Outsourcing Service Segments

IT-enabled outsourcing services are those services that use Information Technology as an enabler for performing activities that include developing service designs, coordinating service deployment, and delivering services. These services are IT-intensive in nature, can be externally contracted (outsourced), and may be provided remotely, using telecommunication or data networks (wire line and wireless).

Some of the unique characteristics of IT-enabled outsourcing services are the service design and deployment activity that focuses on the designing of the delivery process, setting-up technology infrastructure, and preparing for skills required. In addition, the Service delivery phase is longest in duration, and is typically continuous and repetitive. Another characteristic of IT-enabled outsourcing services is the transitioning of service delivery infrastructure, including personnel, from and/or to the client and service provider, either prior to commencement of service delivery or after completion or termination of services.

According to McKinsey & Co., IT-enabled services are expected to grow fifteen-fold by 2008, and within the next twenty years are expected to grow to over a trillion

dollars, with an increasing number of services using IT as an enabler [8]. In addition, Gartner Dataquest's forecasts for business process outsourcing show that worldwide markets for IT services will continue to show strong growth through 2004. Of the total IT services market worldwide, outsourced opportunity is expected to grow at more than 19 percent compounded annual growth rate through 2004 to reach $787.9 billion from $323.6 billion in 1999. [9]

Important IT-enabled outsourcing service segments based on market potential are:

- Data capture, integration and analysis services (comprising data processing, data warehousing and data mining);
- Engineering services (including engineering design, architectural design, product design, geographical information systems);
- Human resource services (including back office operations and strategic HR function outsourcing);
- Information Systems outsourcing (including hardware/software maintenance, application development, network management);
- Multimedia and animation services (including content development, content management, web-sites, animation films);
- Remote customer interaction services (comprising call center outsourcing, fulfillment center outsourcing, e-support centers); and
- Transcription services (including medical and legal transcription services, and legal database services). [8][9]

A major challenge for **e**$^{\textbf{scm}}$ developers is to design the model so it is applicable and effective for use in all of these service segments. The model's efficacy will be empirically tested during the next three to five years. To date, it has been tested in three segments: remote customer interaction, engineering services, and information systems outsourcing.

IV. Development of the eServices Capability Model - e^scm

Intent of the e^scm

The intent of e^scm is to provide IT-enabled outsourcing service providers with a set of practices that enable them to effectively manage outsourcing relationships by focusing on the critical organizational attributes for people, technology and knowledge and their applicability in the outsourcing process. Codifying these practices is important because, although an IT-enabled outsourcing service provider may be aware of some or all of the issues impacting outsourcing relationships, it may not be able to identify those issues that are critical to establishing viable and mutually beneficial outsourcing relationships with clients. A provider may also need support to develop improvement strategies for those practices that can address these issues effectively. From a client's perspective, the client needs a way to identify critical parameters that impact the service being outsourced, so they can make meaningful comparisons of suppliers' capabilities. This information is essential for forming and developing mutually beneficial relationships between the client and the provider.

To support the various uses of the model, the e^scm will be accompanied by multiple capability determination methods. These method(s) will enable providers to determine their current capabilities to establish and maintain outsourcing relationships and deliver services to their clients. The appraisal methods will also enable clients to consistently compare multiple potential providers with respect to the same capabilities.

In addition to the intents mentioned above, the e^scm will:

- Focus on measuring the capability of an IT-enabled outsourcing service provider for the formation, management and expansion of outsourcing relationships;

- Have an overarching goal of client satisfaction across all phases of the outsourcing process;
- Help providers establish and manage continuously improving outsourcing relationships, as well as innovate to meet changing client requirements;
- Ensure the compatibility of the model with other major quality models to avoid duplication of effort;
- Provide multiple appraisal methods for different purposes for both providers and clients including certification to differentiate providers; and
- Become the preferred resource for best practices and assessment of capabilities in the IT-enabled outsourcing service sector. This includes providing a repository of benchmark practices for use by both providers and clients.

Approach to Model Development

The following approach was used for the development of the **e**$^{\textbf{scm}}$ framework:

1. Existing outsourcing practices were documented through an extensive literature review [10]. Categories identified during the literature review include practices for: vendor selection; management of relationships across the outsourcing process; negotiations; contract management; pricing; measuring performance; and transition and termination of outsourcing.
2. Critical issues needing to be addressed by the model were identified. These covered the formation, management, and expansion of outsourcing relationships.
3. Existing quality models and standards were analyzed to understand their intent and scope. Their potential applicability to the outsourcing process and the critical issues were identified.
4. A set of guiding principles was evolved to address the critical issues, keeping in mind the unique requirements of IT-enabled outsourcing services.

5. Phases of the outsourcing process were identified (Overall, Precontract, Contract Execution, Postcontract) and used as one dimension of the model.
6. Based on the critical issues and the guiding principles, five organizational elements were identified: (1) Organizational Management, (2) People, (3) Business Operations, (4) Technology, and (5) Knowledge Management and are used as a second dimension of the model. These elements need to work as a system across the outsourcing process to ensure the establishment, management and expansion of outsourcing relationships.
7. A set of practices was developed to document the capabilities (roles, responsibilities and resources) for each organizational element and organized by outsourcing phase. In addition to the three outsourcing phases, there are critical issues that span the outsourcing process. These issues required us to incorporate a set of "Overall" practices into the model. Implementation of phase-specific and overall practices should enable a provider to achieve the defined goals. Where applicable, the practices are complementary to existing quality models and standards, e.g., ISO, SW-CMM, People-CMM, and Malcolm Baldrige Criteria for Business Excellence.
8. The practices were then grouped into levels of capability that provide a conceptual structure for continuously improving organizational performance and client relationships. The levels of capability are: Level 1-Initial, Level 2-Performing to meet client requirements, Level 3-Controlling through measurement, Level 4-Enhancing through innovation, and Level 5-Sustaining excellence.
9. The draft practices and framework were reviewed and discussed with a technical advisory board[19] in December 2000. Also, the team sought feedback from experienced service providers who reviewed and

[19] The current technical advisory board is chaired by Dr. Raj Reddy and is comprised of Paul Byrnes, Bill Curtis, Betty Deimel, Bill McEvily, Mark Paulk, Ron Radice, Prabhuu Sinha, K. Thiagarajan, Duncan Wallace, and Jane Siegel, ex-officio.

commented on the practices and the framework. Their feedback was incorporated and an initial pilot test of the model and method was conducted at a U.S. call center that provided technical product support in the banking and financial sector.

10. Pilot testing of the model and evaluation for certification method was done in a second call center in India and in an Engineering Services service provider, and in the U.S. for an IT infrastructure support organization in the healthcare domain. Results from the four pilot appraisals were used to improve and refine the model and method.
11. The technical advisory board conducted a review of the Executive Summary, Model Overview, and detailed practice descriptions drafts during their August, 2001 meeting. Revisions based on their feedback were incorporated into each of the documents.
12. An additional briefing and review of the framework and practices was done at an invitational workshop conducted at Carnegie Mellon University in Fall 2001. Participants in this workshop confirmed the need for the model and provided input to improve this material and to plan the change control process that will be used with this release of version 1.0 (the expectation is that a revised version will be released in approximately 18 months).

The remainder of this section presents the detailed approach and development of this capability model for IT-enabled outsourcing service providers including the identification of critical issues across the outsourcing process, and an analysis of the applicability of other quality models.

Modeling IT-enabled Outsourcing Service Provider Capabilities

Critical issues

Based on an extensive review of the literature [10] and interviews with IT-enabled outsourcing service providers, we found that successful outsourcing necessitates a

focus on: 1) the activities leading to the formation of outsourcing relationships (precontract activities); 2) service design and deployment; 3) the delivery and enhancement of the outsourced services (contract execution activities); and, 4) transitioning outsourced services to the client during contract completion or termination (postcontract activities).

Critical issues were identified that fall into the “Precontract”, “Contract Execution” and “Postcontract” phases of the outsourcing process. In addition, some of these critical issues, for example management of client relationships and performance measurement, were also found to span these three phases of the outsourcing process.

Overall issues

Issues that span the phases of outsourcing process are grouped together as **Overall**. The Overall critical issues include:

- Establishing outsourcing relationships with clients based on trust, especially in global outsourcing;
- Managing client expectations for outsourcing;
- Ensuring a positive client experience during face-to-face and remote interactions;
- Managing multi-cultural differences, combined with organizational cultural differences, that impact the quality of interactions and therefore the overall quality of an outsourcing relationship;
- Ensuring the confidentiality of clients’ intellectual property;
- Managing subcontractor relationships to ensure adherence to service levels;
- Guarding against breakdowns in communication with the client;
- Developing and maintaining an environment that improves employee satisfaction, motivation and retention, which is critical to preserving contextual knowledge and ensuring consistency and continuity of service;
- Capturing and transitioning lessons learned from different outsourcing contexts, and,

- Measuring service performance, client satisfaction, and employee satisfaction.

Precontract Phase issues

The **Precontract Phase** has an overall objective of understanding client requirements and assessing capabilities to meet the requirements, in order to form outsourcing relationships. There are two stages in the Precontract Phase: 1) Requirements Management covers the exchange of information and requirement elicitation, with emphasis on formation and management of the relationship; and, 2) Contract Formulation covers negotiation and contract finalization. Critical issues during the precontract phase are:

- Establishing well defined contracts, even with strategic partners;
- Differentiating service offerings to enable clients to understand the relative capabilities of competing organizations;
- Ensuring compliance with statutory requirements, especially in global outsourcing;
- Implementing practices to translate implicit and explicit requirements into deliverables of defined and desired quality; and,
- Innovating, building flexibility, and increasing responsiveness to manage shortening service lifecycles.

Contract Execution Phase issues

The **Contract Execution Phase** has an overall objective of translating client requirements into deliverables of desired quality through service design, deployment, delivery, and enhancement. There are two stages in the Contract Execution Phase: 1) service design and deployment covers the designing of service based on specified requirements and transition and/or deployment of designed service; 2) service delivery and enhancement covers the delivery of the service and improvements made based on feedback and analysis of performance. Critical issues during the contract execution phase are:

- Improving the understanding of the service design and deployment activities and their relationship to the quality of the end service;
- Managing rapid technological shifts and maintaining technology availability, reliability, accessibility and security;
- Reviewing and controlling the service design, deployment and delivery to adhere to desired service levels; and,
- Ensuring visibility into the service design and deployment stages for the purpose of controlling, managing and reporting.

Postcontract Phase issues

The **Postcontract Phase** has an overall objective of learning from the contractual experience and ensuring a positive client experience, even in instances where an engagement is terminated because of irreconcilable issues. The Postcontract Phase covers a provider's response to, and management of, termination or contract completion and reverse transition. Critical issues during the postcontract phase are:

- Implementing management practices during transition of services back to the client that ensures a positive client experience;
- Measuring and analyzing reasons for occurrence of a termination;
- Ensuring against re-occurrence of terminations for cause[20];
- Collecting, analyzing, and transferring to the client lessons learned from an engagement; and,
- Maintaining continuity in outsourcing management.

The ability of a service provider to address these critical issues ensures the formation of viable and mutually beneficial outsourcing relationships with its clients. This is achieved by a coordinated functioning of organizational elements across the entire outsourcing process.

[20]A contract maybe terminated early either by the client or the service provider for cause (e.g., inability to meet service levels, negative impact on client's business) or no-cause, before the planned contract completion date.

Elements of a service provider's organization

The elements of a service provider's organization that are critical for the success of outsourcing relationships include: (1) organizational management that provides direction, sets objectives, and establishes systems and procedures needed to achieve these objectives; (2) personnel policies and procedures, and appropriately skilled people to provide services; (3) design, deployment and delivery of services; (4) technology infrastructure for service related and support activities; and, (5) organizational knowledge, which is a basis for controlling performance and initiating improvement.

Therefore, a model for IT-enabled outsourcing services should address these key organizational elements across the precontract, contract execution and postcontract phases of the outsourcing process. To determine whether a separate quality model was needed, and the extent to which the existing process and system quality models and standards address the critical issues in IT-enabled outsourcing, a comparative analysis of other quality models and standards was conducted.

An Analysis of Quality Models and Their Applicability to IT-enabled Outsourcing Services

The **e**$^{\mathbf{scm}}$ development team analyzed the principles and frameworks underlying the prevailing process and system quality models and examined their applicability to the identified issues in IT-enabled outsourcing services. The models and standards analyzed included: 1) the family of Capability Maturity Models (CMM) developed by the Software Engineering Institute; 2) the International Organization for Standardization's (ISO) family of models, including ISO 9000 and ISO 15504; 3) the Malcolm Baldrige Criteria for Performance Excellence; and, 4) Six Sigma^{TM}. Each of these models and standards are briefly discussed below.

CMM Family of Models

The Software CMM is designed to guide software organizations in performing Software Process Improvement (SPI) by determining current process maturity and by identifying the issues most critical to software quality and continuous process improvement. The “Software Acquisition CMM” and the “People CMM” provide guidance to software organizations in managing the acquisition of software intensive systems and managing people’s performance and development. The “People CMM” has been applied to disciplines other than software. To implement process improvement in all organizational processes such as development, acquisition and management of people, an organization needs to implement multiple quality models. The “CMM Integration” (CMMI) effort addresses the above issue by integrating multiple discipline-specific process areas into one common framework. While covering many issues critical to process improvement for software development, the CMM/CMMI models do not adequately address all the processes critical to IT-enabled outsourcing services. In particular these models do not provide complete coverage on the processes that occur prior to finalization of a contract with specified requirements, the processes that occur after services are designed and deployed (e.g., installation, delivering services on a continuous basis) and postcontract processes.

The ISO Family of Models

The ISO 9000:2000 series specifies requirements for a quality management system where an organization needs to; 1) demonstrate its ability to consistently provide products that meet customer and applicable regulatory requirements; and, 2) address customer satisfaction through the effective application of the system, including processes for continual improvement and the prevention of nonconformity. The ISO 9000 series addresses contracting to the limited extent that the contract should be reviewed by the organization before acceptance. ISO addresses the contract execution phases from a quality management system perspective. However, the activities and issues critical to IT-enabled outsourcing services in the precontract phases and the postcontract phases are not addressed explicitly. Interpretations of ISO 9000 standards also vary widely depending on the business context.

ISO has developed the ISO 15504 in order to address the need for an international standard for software process assessment. It is based on process improvement concepts similar to the CMM family of models and therefore does not adequately address the critical issues in IT-enabled outsourcing services.

Malcolm Baldrige Criteria for Business Excellence

The Malcolm Baldrige Criteria for Performance Excellence 2000 is based on a set of seven criteria made of core values and concepts that are represented as two triads. The Leadership triad is comprised of leadership, strategic planning and customer and market focus sets of criteria. The Business Results triad includes human resource focus, process management and business results sets of criteria. Both triads are based on the foundation of information management and analysis. The use of the criteria for assessing and improving capabilities in the rapidly evolving IT-enabled outsourcing service sector is limited since it does not provide specific practices to address the critical issues in the various phases of the outsourcing process. Further, the Malcolm Baldrige National Quality Award recognizes performance excellence just for organizations that are based in the U.S.A.

Six Sigma™

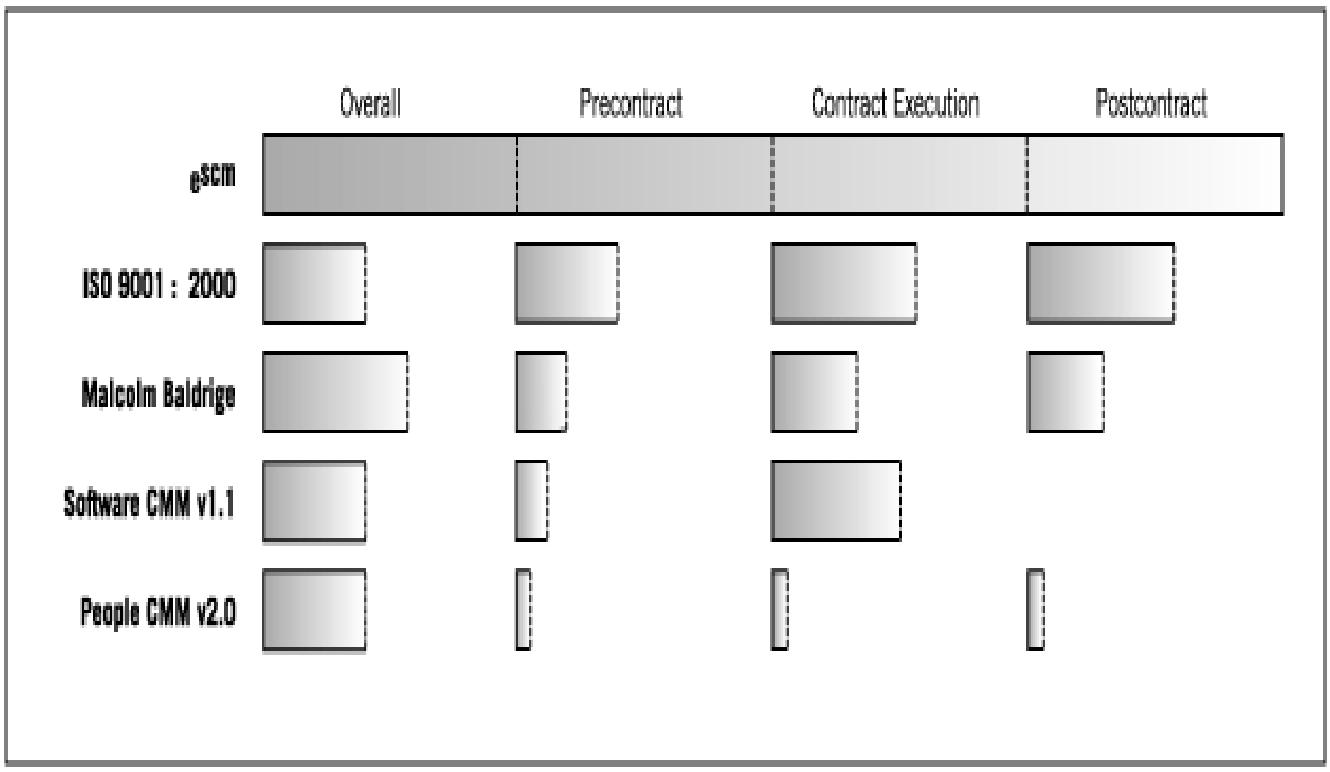
The Six Sigma™[21] approach provides methods and infrastructure to implement principles of Statistical Process Control in order to achieve defect rates of as low as 3.4 defects per million opportunities, i.e., achieve a process capability of 6σ. The approach is primarily aimed at reducing waste in the business processes of an organization, and takes a project-based view of the organization rather than a system view. Therefore, the Six Sigma™ approach could be used to improve specific activities within the outsourcing process.

Individually, and as a whole, the existing quality models reviewed do not adequately address all the issues in an outsourcing process. Also, these models do not readily provide methods to assess capabilities of IT-enabled outsourcing service

[21] Trademark of Motorola, Inc.

providers to establish, manage and improve outsourcing relationships with clients. These models either emphasize a level of structure that may interfere with success in an outsourcing context, where flexibility and adaptability are important or, are so generic that their interpretation and usage varies significantly. Figure 2 provides a high-level graphic indication of comparative model coverage. A more detailed description of the comparative coverage with **e^{scm}** practices is shown in Appendix A.

Figure 2. Comparative Model Coverage.



The next chapter discusses the **e**$^{\mathbf{scm}}$ guiding principles, the model framework, and the capability levels.

V. The eServices Capability Model - e^scm

Guiding Principles for the e^scm [22]

Seven principles form the foundation for the practices defined in the e^scm framework. These principles were evolved based on the critical issues identified and address the impact of these issues on a service provider's capability. Use of these principles enables providers to continually improve their performance by focusing on building strong client relationships and addressing all stakeholder needs. These principles characterize the behavior of capable IT-enabled outsourcing service providers and were used as guidance for defining the practices of the e^scm. Each principle, its purpose, and its interrelationships in IT-enabled outsourcing service business are summarized below.

1. **Adopting a systems perspective**

   To effectively achieve organizational goals and objectives providers need to identify, understand and manage a system of interrelated organizational elements across the phases of outsourcing. The principle of a systems perspective provides a foundation for the establishment of the other six principles.

2. **Communicating effectively with all stakeholders**

   Providers need to communicate effectively with stakeholders. Stakeholders include clients, business partners, investors, the business environment and employees. Communication is a vital link between the various organizational elements and it enables the achievement of organizational objectives through the elements' coordinated functioning. Open communication fosters sharing of client and end-user related knowledge across the organization.

[22] Terms used in this model are defined in the Glossary found in Appendix B of this document.

3. Building confidence and trust with all stakeholders

Providers need to build a culture of openness that instills confidence in their stakeholders. This promotes the ability to establish and nurture mutually beneficial and trusting relationships with external stakeholders. Multi-national and organizational cultural differences between the provider and its clients, and cultural differences within the provider may impact the quality of interactions and the overall quality of the outsourcing relationships. Building confidence with stakeholders enables better management of these cultural differences. Building confidence and trust also facilitates a coordinated service design, deployment and delivery that match well with the users' context and requirements. Additionally, building confidence and trust promotes a culture of innovation.

4. Fostering an innovative and responsive culture

Providers need to create value for stakeholders in an ever-changing, highly competitive business environment. Providers should be structured in a way that innovation and responsiveness to client and business requirements becomes a part of their culture and daily work.

5. Managing by measures

Providers need to manage their organizational operations by identifying and utilizing measures or indicators that best represent the factors that lead to improved client, operational and financial performance. Information (facts) forms the basis for understanding both the system and procedural performance needed to guide improvements. Analyzing information generated internally as well as collected from external sources helps in predicting and managing problems.

6. Improving continuously and being client-centered

Providers need to retain and increase their customer base by continually enhancing their service capability. This is achieved by aligning organizational objectives with changing needs of the clients.

7. Enhancing value to all stakeholders

A provider's competitive advantage depends on its capability to provide continually increasing value to its stakeholders. This is achieved by establishing a challenging environment that promotes performance across all phases of the outsourcing process.

The e^scm Framework

The e^scm framework has two-dimensions: 1) Phases of the Outsourcing Process (precontract, contract execution, and postcontract phases) and, 2) Organizational Elements. Based on the guiding principles, practices are defined for each organizational element to address the critical issues for IT-enabled outsourcing services. In addition, these practices are grouped into sets that represent the capability levels of the IT-enabled outsourcing service providers. A detailed mapping of principles and practices is in Appendix C.

These practices are defined for each organizational element as: overall practices and phase-specific practices. The overall practices span the entire outsourcing process, as their applicability is not limited to a specific phase. The overall practices include implementation and institutionalization of: 1) overall organizational direction, policies, procedures, resource planning and reviews; 2) personnel management and aspects of personnel motivation/growth; 3) remediation and preventive actions in business operations; 4) technology management and disaster recovery; and, 5) measurement and analysis for performance improvement and knowledge sharing. The Phase-specific practices reside at the intersection of the organizational element with the outsourcing phases. A schematic of the e^scm framework is presented in Figure 3. Following the figure is a more detailed explanation of the e^scm framework, including the outsourcing phases, organizational elements and capability levels.

Figure 3. e^{scm} Phases and elements

e^{scm} Practices	ORGANIZATIONAL ELEMENTS				
	Organizational Management	People	Business Operations	Technology	Knowledge Management
Overall Practices					
Outsourcing Phases	**Precontract Phase**				
Requirements Management					
Contract Formulation					
	Contract Execution Phase				
Service Design and Deployment					
Service Delivery and Enhancement					
	Postcontract Phase				
Transition					

Phases of the e^{scm}

Precontract Phase has an overall objective of understanding client requirements and assessing capabilities to meet the requirements, in order to form outsourcing relationships. There are two major stages in the precontract phase. These stages are comprised of two sets of activities each.

1. Requirements Management includes:
   - Discovery – the exchange of information and requirements between clients and providers with an emphasis on relationship building and relationship management; and
   - Requirement Specification – the elicitation and documentation of implicit and explicit client requirements.
2. Contract Formulation includes:

- Negotiation – includes deliverables, service levels, pricing, and control points; and
- Contract Finalization – incorporating the outcome of the negotiation phase into a formal Contract.

Contract Execution Phase has an overall objective of translating client requirements into deliverables of desired quality through service design, development and deployment. There are two major stages in the contract execution phase. These stages involve two and one sets of activities, respectively.

1. Service Design and Deployment includes:
   - Service design – when the service is designed based on specified requirements; and
   - Transition and/or deployment of service – when the designed service is deployed, either with the client or at the provider, which may be accompanied by transition of assets to and from the client.
2. Service Delivery and Enhancement – when the service is delivered according to client requirements and feedback is obtained. Enhancements are made to the service and its delivery process, as necessary, during the tenure of a service engagement.

Postcontract Phase has an overall objective of learning from contractual experiences and ensuring a positive client experience even in adverse circumstances. There is one postcontract stage, Transition. It includes three sets of activities.

- Reverse Transition – occurs after either termination or contract completion and includes the handing over of all contract-related assets to the client. It may be necessary to maintain service levels during this transition.
- Termination – when the contract is prematurely terminated either by the client or the provider for cause or no cause (before the planned contract completion date); or
- Contract Completion – occurs when the contract expires.

Organizational Elements in the e^{scm}

IT-enabled outsourcing service providers' operations are comprised of interdependent elements. These organizational elements are required to function in a dynamic environment as a coordinated system across the outsourcing process. The e^{scm} addresses five organizational elements with respect to their contribution to the formation, management and expansion of outsourcing relationships. The organizational elements and their applicability in the e^{scm}, are summarized below:

1. Organizational Management

Organizational Management involves coping with a unique set of challenges in the highly dynamic, and increasingly global, IT-enabled outsourcing service business. To remain competitive in the face of rapid technological shifts, leaders need to rapidly develop, and also retain, organizational competencies. Organizational leadership needs to establish systems for effective communication and client relationship management. Leaders also need to set service quality expectations and provide required resources. Roles that may be associated with the Organizational Management element include: visionary leaders, team builders, and implementers.

2. People

The quality of personnel is a key determinant of service capability and service quality in the IT-enabled outsourcing services business. Knowledge is an important source of competitive advantage to a provider and it is manifested through its people. To motivate continuous improvement of the workforce, specifically when the members of the workforce are not interchangeable, a provider needs to perceive of its people as assets and manage them accordingly.

3. Business Operations

Business Operations refers to coordinated working of organizational functions and resources, people, technology and techniques, for the purpose of delivering a

service to a client. To become a supplier of choice Business Operations must adhere to a specific sequence of steps, with documentation of procedures and requirements, including well-defined measurement and control mechanisms. Well-managed operations improve client retention and referral rate.

4. Technology

Technology plays an important role in the IT-enabled outsourcing services business as an enabler for service design, development and delivery. The quality and availability of technology determines a provider's capability to instill confidence in its clients regarding service capability, security and reliability. It also enables a provider to provide an effective work environment to its personnel.

5. Knowledge Management

Knowledge management is a function in which a provider consciously and comprehensively gathers, organizes, refines, analyzes and disseminates its knowledge to further its objectives. Information and its analysis are critical to effective management and to a fact-based system for improving provider performance and competitiveness.

Levels of Capability of the eServices Capability Model

The five Capability Levels of **e**$^{\textbf{scm}}$ describe an improvement path for a service provider's progress from a minimal level of having the capability to deliver service that meets client requirements, up to the highest level of enhancing value through continuous innovation. The five levels of capability that define this path are: Level 1 – Initial, Level 2 – Performing to meet client requirements, Level 3 – Controlling through measurement, Level 4 – Enhancing through innovation, and Level 5 – Sustaining excellence. The graphic which provides a summary view of the levels is in the Executive Summary, Section I, page 5.

At an Initial Level, service providers generally improvise service delivery and lack sound management practices. Association with these service providers has a high degree of risk and the client may never achieve a positive gain from the outsourcing effort either in the form of financial benefits or business value. In fact, a negative

outsourcing experience could result in higher costs and lost business opportunity for the client.

In comparison, even with the lowest level of capability, a service provider has formalized procedures for capturing requirements and delivering the service according to commitments made to clients. With increasing capability such a provider is able to continuously learn from experience, measure and control its activities, and proactively respond to changes in the external or internal business environment.

For a capable service provider, client satisfaction is the key driver. Its established procedures, people, and technology infrastructure are continuously monitored, managed and improved, always striving to provide and enhance value to clients. Innovative personnel, the latest technology and a sound understanding of their clients and end-users are typical characteristics of such service providers. Setting realistic expectations, completing contracts within budget and on time, and a disciplined approach to delivering service are some additional operational characteristics of such a service provider.

Following is an explanation of the characteristics of service providers at the different Levels of Capability, as specified in the **e**$^{\mathbf{scm}}$. These levels are derived by grouping practices that characterize the behavior of a service provider into their appropriate capability level.

e$^{\mathbf{scm}}$ Level 1 - Initial

The provider at the 'Initial' level of capability lacks sound management practices, and typically may not be effective in the various phases of the outsourcing process. At Level 1, a provider has not implemented all the basic practices as defined for Level 2. The provider operates without formalized systems or procedures; even if systems and procedures exist, there are no management mechanisms to ensure that they are followed. Senior management is not exposed to, or does not understand, the key problems and issues faced by their own organization. Frequent crises, exceeded budgets and missed schedules are some of the other operational characteristics of such a provider. Thus, a Level 1 provider is almost always unable to effectively address its

clients' requirements. In rare instances, personnel may deliver acceptable service as a result of luck or heroics. This Level is included in **e**$^{\mathbf{scm}}$ framework to provide a basis for comparing service provider characteristics at higher capability levels.

e$^{\mathbf{scm}}$ Level 2 – Performing to Meet Client Requirements

Providers at a Level 2 capability are able to deliver specific services according to stated client expectations, provided the services do not significantly vary from the provider's experience(s). The practices needed to achieve the set of capabilities for an organization at Level 2 are based on the following principles[23] of the **e**$^{\mathbf{scm}}$:

- **Adopting a systems perspective** to enable a coordinated functioning of the organizational elements in order to deliver services required to meet stated client requirements.
- **Communicating effectively with all involved stakeholders** with an emphasis on 1) clear definition of roles and responsibilities of the provider and the client, 2) clarity of communication between the client interaction team and the service design and deployment team, and 3) communication of service expectation to subcontractors and vendors.
- **Building confidence and trust** with all stakeholders to facilitate a coordinated design, deployment and delivery of service.

Based on the guiding principles, the Organizational elements work as a system at Level 2 to achieve the following:

- **Organizational Management** establishes unity of purpose and direction for the service provider; promotes open communication with stakeholders, manages risks specific to client engagements; and fosters a culture of adhering to service commitments.
- **People element** develops and provides for skills needed to meet client requirements.

[23]See Appendix C for mapping of principles and practices.

- **Business Operations element** facilitates the capture and translation of implicit and explicit requirements into deliverables of desired quality; builds flexibility into contracts to deal with shifts in client's priorities; ensures compliance with applicable statutory requirements, facilitates the selection development and nurturing of subcontractors or vendors as needed; defines and measures service levels; ensures adherence to desired levels of confidentiality and security; addresses transition management issues including effects on people and business partners; ensures a positive experience to clients during face-to-face and remote interactions; and tracks and control changes made to service components.
- **Technology element** ensures the provision of reliable, accessible technology; protects against breach of security; prepares for adverse situations that are not in the control of the service provider; and facilitates communication.
- **Knowledge Management element** provides effective and efficient access to required information and the expertise necessary to deliver committed services.

At Level 2, the service provider is able to systematically capture and understand client requirements, design and deploy a service to meet the requirements, and successfully deliver the service according to agreed upon service levels. The service provider supports this capability through: training and/or acquiring personnel as required; making available necessary infrastructure (including technology) for meeting client requirements; and collecting and disseminating information required to control and track the service delivery. A provider at Level 2 has a minimum set of capabilities achieved through the implementation and institutionalization of fifty-one practices that are spread across the outsourcing phases for the five organizational elements. At Level 2, enhancements to the service, if any, may not be happening in a systematic manner.

e^{scm} Level 3 – Controlling through Measurement

Providers at Level 3 have implemented all Level 2 practices. In addition, providers at Level 3 are capable of delivering services according to stated client requirements, even if the required services differ significantly from the provider's experience. The practices needed to achieve the set of capabilities for an organization at Level 3 are based on the following principles of e^{scm}, in addition to those already covered at Level 2:

- **Communicating effectively with all involved stakeholders** with an emphasis on sharing client and end-user related knowledge within the provider's organization;
- **Building confidence and trust with all stakeholders** is facilitated through efforts to identify and bridge cultural gaps between the provider and its clients; and,
- **Managing by measuring** the performance of the established procedures and practices, with an emphasis on controlling performance and correcting identified problems.

Based on the guiding principles, the five Organizational elements work as a system at Level 3 to achieve the following:

- **Organizational Management element** facilitates bridging cultural differences; defines a systematic approach towards planning and providing adequate resources; and, implements a factual approach to review and verify the organization's performance.
- **People element** encourages the formation and functioning of inter-functional teams during requirements specification and negotiations; facilitates participation of individuals in decision making; facilitates sharing of knowledge and experience in teams and groups; objectively appraises and rewards performance of employees and teams; and, facilitates individual and organizational learning.
- **Business Operations element** facilitates a systematic approach towards assessing and managing risks; proactively collects feedback from clients and

end-users for service enhancement; and, plans for ensuring flexibility in the scale of operations.

- **Technology element** facilitates inter-operability across multiple technological platforms; and, quickly scales-up technology to meet client requirements.
- **Knowledge Management element** facilitates the use of measures for managing and improving organizational performance; facilitates internal transitioning of organizational learnings based on previous client engagements and different outsourcing contexts; and, enables factual decision making to mitigate risks and achieve competitive advantage.

At Level 3, the service provider is able to: objectively measure and control its activities; proactively understand targeted market segments and their varying requirements, including specific cultural attributes; identify and manage risks; design and deliver services based on established procedures; and, verify its activities. The provider supports this capability through sharing and using lessons learned from previous engagements; objectively measuring and rewarding personnel performance; and monitoring and controlling technology infrastructure.

Improvements are reactive and are typically generated from the defined measurement and verification activities. Having established systems for forming and managing client relationships, providers at Level 3 continuously aim to improve the services delivered. At Level 3, in addition to the practices of Level 2, the provider implements and institutionalizes another thirty-one practices that are spread across the outsourcing phases for the five organizational elements.

e^scm Level 4 – Enhancing though Innovation

Providers at Level 4 have practices implemented at Level 2 and Level 3. In addition, providers at Level 4 are able to continuously enhance their capability to meet evolving client requirements. The practices needed to achieve the set of capabilities for an organization at Level 4 are based on the following principles of e^scm, in addition to those already covered at Level 2 and Level 3:

- **Building confidence and trust with all stakeholders** also promotes an environment that supports innovation.
- **Fostering an innovative and responsive culture** enables the service provider to differentiate its offering through innovative and customized service offerings.
- **Enhancing value to all stakeholders** through innovation.

Based on the guiding principles, the Organizational elements work as a system at Level 4 to achieve the following:

- **Organizational Management element** provides an environment that promotes lasting relationships with clients; plans and carries out surveys or studies to understand the perception of clients and end-users; and, utilizes learnings to enhance value for stakeholders.
- **People element** implements programs to have an empowered, motivated, well-informed and stable workforce, and encourages innovation by providing necessary resource and incentives.
- **Business Operations element** initiates and plans for proactively responding to varying client needs, and establishes procedures to manage and improve client satisfaction.
- **Technology element** builds capabilities to keep pace with rapid changes in technology.
- **Knowledge Management element** objectively determines capability baselines through measurement and analysis of organizational performance; and, facilitates benchmarking as a means of continuous improvement.

At Level 4, the service provider is able to: customize its approach and service for clients and prospective clients; understand client perceptions; and, predict its performance based on previous experiences. The provider supports this capability through: giving personnel freedom to choose innovative approaches in achieving organizational objectives and providing opportunities for professional development; systematically evaluating and incorporating technology advances; and, setting performance goals from a comparative analysis of its current performance, as well as from internal and external benchmarks.

Enhancements are proactive and are typically generated from the provider's benchmarking of its performance. Enhancements are systematically planned, implemented and controlled. At level 4, in addition to the practices of Level 2 and Level 3, the provider implements and institutionalizes another seventeen practices that are spread across the outsourcing process for the five organizational elements. Providers at Level 4 continuously enhance their activities and add value to the client.

e^{scm} Level 5 – Sustaining Excellence

Providers at Level 5 have all the practices implemented at Level 2, Level 3 and Level 4. Demonstration, over a defined period of time of sustained value enhancement for stakeholders (during two Certification Evaluations) leads to a service provider achieving the capability of 'Sustained Service Excellence' – Level 5.

VI. The e^{scm} Practices

The practices in the e^{scm}, are listed in Tables 1.1 through 1.5. Each table displays the practices for one of five organizational elements and groups them as overall or within the three outsourcing phases. A glossary of terms used in the practices is included in Appendix B. To facilitate use of the practices we have also provided the same information included in Tables 1.1 - 1.5 sorted by capability level in Appendix D.

Detailed practice descriptions for each practice of the e^{scm} are provided in Volume 2 entitled "Practice Descriptions".

Common Practices

There are several practices designated as common practices. These practices foster implementation and institutionalization of the other practices by:

a) Providing direction and ensuring organizational sponsorship

b) Defining clear organizational structure

c) Ensuring the availability of resources

- Trained personnel
- Adequate technology infrastructure

d) Collecting and analyzing measures of performance for determining the effectiveness

e) Verifying implementation through planned reviews and audits

f) Providing remediation and implementing steps to prevent occurrence of problems

g) Using the organizational knowledge and work products generated for future engagements.

These common practices are grouped together by capability levels. A service provider, who aims to achieve Level 2 capabilities of the **e**$^{\text{scm}}$, will need to implement and institutionalize five practices, in addition to their respective "input practices".

Level 2

1	Org_Over_1	Define and communicate organizational objectives.
2	Ppl_Over_3	Assign roles and responsibilities to personnel based on appropriate skills.
3	Ppl_Over_4	Plan to meet identified needs by providing training or acquiring personnel.
4	Ppl_Over_6	Establish and maintain a work environment that enables the personnel to work effectively.
5	KM_Over_5	Identify, control, and make available the information required to implement activities defined in the organization's procedures.

Similarly, to achieve Level 3 capability, a service provider will need to implement and institutionalize the following nine practices, in addition to the practices at Level 2.

Level 3

1	Org_Over_2	Define and communicate the roles, responsibilities, and authority of personnel in the organization.
2	Org_Over_4	Establish and implement procedures, at appropriate levels in the organization, for periodically reviewing the organization's performance.
3	Org_Over_6	Identify and provide adequate resources for performing service-related and support activities.
4	Org_Over_13	Establish and implement procedures to verify whether procedures are being executed as planned.
5	Ops_Over_4	Provide remediation to prevent reoccurrence of identified problems.
6	Ops_Over_5	Proactively identify potential problems and implement preventive actions to preclude their occurrence.
7	KM_Over_1	Identify, collect, and furnish performance measures for established procedures and programs.
8	KM_Over_6	Establish and implement procedures for the capture, analysis, and dissemination of knowledge gained from client engagements.
9	KM_Over_7	Establish and implement procedures to identify, collect, and reuse work products and service components.

Finally, to achieve Level 4 capability using the **e**$^{\mathbf{scm}}$, the service provider will need to implement and institutionalize all the Level 2 and Level 3 practices.

Table 1.1: Practices Overview - Organizational Management

I. OVERALL PRACTICES (Org_Over_*)

1. Define and communicate organizational objectives.
2. Define and communicate roles, responsibilities, and authority of personnel in the organization
3. Plan and implement programs to achieve organizational objectives.
4. Establish and implement procedures for periodically reviewing the performance of the organization at appropriate levels.
5. Utilize lessons learned from performance reviews to identify opportunities for improvement.
6. Identify and provide adequate resources to perform service related and support activities.
7. Establish and implement procedures for developing relationships with clients and prospective clients.
8. Establish and implement procedures to understand the perceptions of current and prospective clients about the organization and its services.
9. Establish and implement procedures to collect and disseminate client and end-user related knowledge.
10. Define a risk management policy.
11. Define the organization's policies on security and confidentiality and, communicate to stake holders.
12. Establish and implement procedures to verify whether programs to achieve organizational objectives are being implemented as planned.
13. Establish and implement procedures to verify whether procedures are being implemented as planned.

II. PHASE SPECIFIC PRACTICES

A. Pre-Contract (Org_Pre_*)

Requirements Management

None

Contract Formulation

1. Define guidelines for negotiations with potential or existing clients.
2. Define guidelines for pricing of services.
3. Establish and implement procedures for contracting and handling contract amendments.

B. Contract Execution (Org_Exe_*)

Service Design and Deployment

1. Establish and implement procedures to communicate client requirements from the client interaction team to the service development team.
2. Determine specific cultural attributes required for providing the intended service, and initiate actions to achieve cultural fit.
3. Plan and implement practices to manage risks specific to the contract.

Service Delivery and Enhancement

None

C. Post-Contract (Org_Post_*)

Transition

1. Establish and implement procedures to ensure continuity of service during contract completion or contract termination.

Table 1.2: Practices Overview - People

I. OVERALL PRACTICES (Ppl_Over_*)

1. Identify the personnel competencies needed to achieve organizational objectives.
2. Develop personnel competence needed to achieve organizational objectives.
3. Identify personnel for the roles and responsibilities on the basis of appropriate skills.
4. Plan and provide training or acquire personnel to meet identified needs.
5. Evaluate the effectiveness of training in achieving intended objectives.
6. Establish and maintain a work environment that allows personnel to work effectively.
7. Provide opportunities for personnel to develop skills needed for their career development.
8. Establish and implement procedures for individuals and groups to participate in decisions that affect their work and commitments.
9. Define and implement a reward system that encourages achievement of organizational objectives.
10. Obtain and utilize feedback from personnel for organizational improvement.
11. Support innovation and entrepreneurship by personnel in achieving organizational objectives.
12. Designate a team responsible for monitoring technology innovations and introducing appropriate technologies into the organization.
13. Establish and implement procedures for appraising individual and team performance.

II. PHASE SPECIFIC PRACTICES

A. Pre-Contract (Ppl_Pre_*)

Requirements Management

1. Designate team(s) to understand prospective client needs and position the organization's capabilities.

Contract Formulation

2. Designate a team to negotiate with clients.

B. Contract Execution (Ppl_Exe_*)

Service Design and Deployment

1. Designate qualified personnel or team(s) to design and deploy the service, as per client requirements.
2. Identify skills needed to meet specific client requirements.

Service Delivery and Enhancement

None.

C. Post-Contract (Ppl_Post_*)

Transition

1. Maintain an inventory of skills being transferred to the client during reverse transition.

Table 1.3: Practices Overview - Business Operations

I. OVERALL PRACTICES (Ops_Over_*)

1. Establish and implement procedures for selecting subcontractors and vendors based on their ability to meet identified requirements.
2. Monitor performance of subcontractors/vendors against their commitments, and take appropriate action.
3. Establish and implement procedures for capturing interactions with clients.
4. Provide remediation to prevent reoccurrence of identified problems.
5. Identify potential problems and implement preventive actions to preclude their occurrence.
6. Establish and implement procedures to meet client requirements for confidentiality, security, and protection of intellectual property.

II. PHASE SPECIFIC PRACTICES

A. Pre-Contract (Ops_Pre_*)

Requirements Management

1. Establish and implement procedures to capture client requirements.
2. Identify and assess contract-specific risks.
3. Establish and implement procedures to identify and keep contract applicable statutory and regulatory requirements up-to-date.
4. Define roles and responsibilities of the organization and the client with respect to the proposed engagement.
5. Review and ensure the feasibility of meeting client requirements based on present or planned organizational capabilities.
6. Establish and implement procedures for responding to prospective client requirements.

Contract Formulation

7. Identify key issues requiring client agreement prior to negotiations.

B. Contract Execution (Ops_Exe_*)

Service Design and Deployment

1. Establish and implement procedures for designing and deploying the service to meet client requirements.
2. Develop service specifications.
3. Define a plan to design and deploy the service.
4. Define and communicate service expectations to subcontractors/vendors.
5. Design and deploy the service based on the service specification.
6. Track service design and deployment activities against the plan at designated intervals.
7. Define process specifications for delivery of service.
8. Define quality specifications to monitor the quality of service delivered.
9. Develop organization's response to clients and end users for anticipated failures in delivery of service.
10. Establish and implement procedures for review of the designed service.
11. Establish and implement procedures to obtain client feedback on the designed service, and to incorporate necessary changes.
12. Validate the service design against client requirements.
13. Establish and implement procedures to verify and account for resources transferred from the client to the organization.

Service Delivery and Enhancement

14. Plan and deliver the service as per the defined process.
15. Track the service delivery activities against the plan, and take corrective action as required.
16. Monitor service quality according to the defined standards for quality.
17. Establish and implement procedures to periodically track service levels achieved against commitments made to clients, and take corrective actions.
18. Establish and implement procedures to obtain feedback from client at designated milestones.
19. Establish and implement procedures to identify the components of the service being offered and track and control changes made.
20. Establish and implement procedures to make modifications to services.
21. Establish and implement procedures for training of clients/end users as required in client agreements.

C. Post-Contract (Ops_Post_*)

Transition

1. Establish and implement procedures for hand over during contract completion and termination.

2. Obtain and analyze client feedback in case of contract termination.
3. Establish and implement procedures for obtaining feedback from clients/end-users and problem analysis, after contract completion or contract termination.

Table 1.4: Practices Overview - Technology

I. OVERALL PRACTICES (Tech_Over_*)

1. Establish and implement procedures to track and control changes in the technology infrastructure.
2. Establish and implement procedures to manage the security of the technology infrastructure.
3. Establish and implement procedures for acquiring, deploying, and upgrading technology.
4. Establish and implement procedures to identify and introduce appropriate technology.
5. Establish and implement procedures to identify the potential for, the response to, and the recovery from, adverse situations, which affect the ability of the organization to provide service.

II. PHASE SPECIFIC PRACTICES

A. Pre-Contract (Tech_Pre_*)

Requirements Management

1. Define the effort needed and time required for upgrading or acquiring new technology when responding to client requirements.

Contract Formulation

2. Incorporate the licensing of technology as part of agreements made with clients.

B. Contract Execution (Tech_Exe_*)

Service Design and Deployment

1. Establish and implement procedures to integrate an organization's technology infrastructure with that of the client, as appropriate.

Service Delivery and Enhancement

2. Monitor and measure the performance of the technology infrastructure that is required for delivering the service according to agreed upon service levels.

C. Post-Contract (Tech_Post_*)

Transition

1. Establish and implement procedures to transfer technology licenses and intellectual property during reverse transition.

Table 1.5: Practices Overview - Knowledge Management

I. OVERALL PRACTICES (KM_Over_*)

1. Identify, collect, and furnish performance measures for established procedures and programs.
2. Define capability baselines for the organization by analyzing performance data.
3. Establish and implement procedures to validate the results of performance measures.
4. Analyze comparative data from external and internal sources and use it to benchmark organizational performance.
5. Identify, control, and make available the information required to implement activities defined in the organization's procedures.
6. Establish and implement procedures for the capture, analysis, and dissemination of knowledge gained from client engagements.
7. Establish and implement procedures to identify, collect, and reuse work products and service components.
8. Establish and implement procedures for sharing knowledge among stakeholders.
9. Define mechanisms to address the queries that personnel may have on service-related issues.

II. PHASE SPECIFIC PRACTICES

A. Pre-Contract (KM_Pre_*)

Requirements Management

1. Capture and organize client requirements in a knowledge base.
2. Establish and implement procedures for collection, validation, and dissemination of market information about prospective clients.

Contract Formulation

None

B. Contract Execution (KM_Exe_*)

Service Design and Deployment

1. Capture innovative approaches in service design and deployment.

Service Delivery and Enhancement

2. Capture competencies used and developed during contract execution.
3. Establish and implement procedures to capture and analyze resources consumed during contract execution.

C. Post-Contract (KM_Post_*)

Transition

1. Establish and implement procedures to transfer to the client, during reverse transition, the knowledge gained from the specific client engagement.

VII. e^scm - Methods to Determine a Service Provider's Capability

To identify, analyze, and guide improvement of a service provider's capabilities, the **e^scm** will be accompanied by four capability determination methods. These methods will address the needs of service providers and their clients for determining the capability of the provider relative to the **e^scm**. The methods will use the **e^scm** Version – 1.0 as the reference model. These methods will determine capability through a systematic analysis of the implementation and institutionalization of the practices defined in the **e^scm**.

The **e^scm**-based capability appraisal method(s) will enable providers to determine their current capabilities and define targets for self-improvement. These methods will also enable clients to compare multiple potential providers with respect to the same capabilities, measured in a consistent manner. Thus, the objectives of **e^scm** appraisals are to:

1. Identify and derive a Capability Profile, which includes the strengths, weaknesses and status of the improvement efforts for a service provider;
2. Identify a service provider's strengths, weaknesses and associated risks as decision inputs for client when selecting a service provider; and
3. Support, guide, and encourage a service provider's commitment to continuous self-improvement.

The scope of an appraisal or evaluation will be determined relative to the service provider's needs and the business goals of the sponsor[24]. The four different methods of appraisal and evaluation that will be available from IT^sqc are: 1) Certification Evaluation; 2) Capability Appraisal; 3) Rapid Capability Evaluation; and, 4) Rapid Capability Appraisal. Each method is described briefly below.

The Certification Evaluation is a third-party external evaluation of an organization's capability, sponsored by the service provider itself or by its client(s). The evaluation team for this method is trained by Carnegie Mellon University and authorized to perform external appraisals of organizations. The evaluative data will be rigorously reviewed by CMU and when warranted, will result in certification by CMU of the

[24] A sponsor may be either the client or a service provider.

provider's capability. CMU will issue the certificate with a Capability Level and a Capability Profile.

The Capability Appraisal is the method that provides a starting point for initiating capability improvement in the service provider's organization. The appraisal team for this method consists of members who can be both internal and external to the appraised organization. The focus of this method is to identify areas of improvement based on the **e**$^{\mathbf{scm}}$. Results of this method include a gap analysis between the **e**$^{\mathbf{scm}}$ practices and the provider's implementation of these practices. This appraisal can also be used to prepare for a certification evaluation.

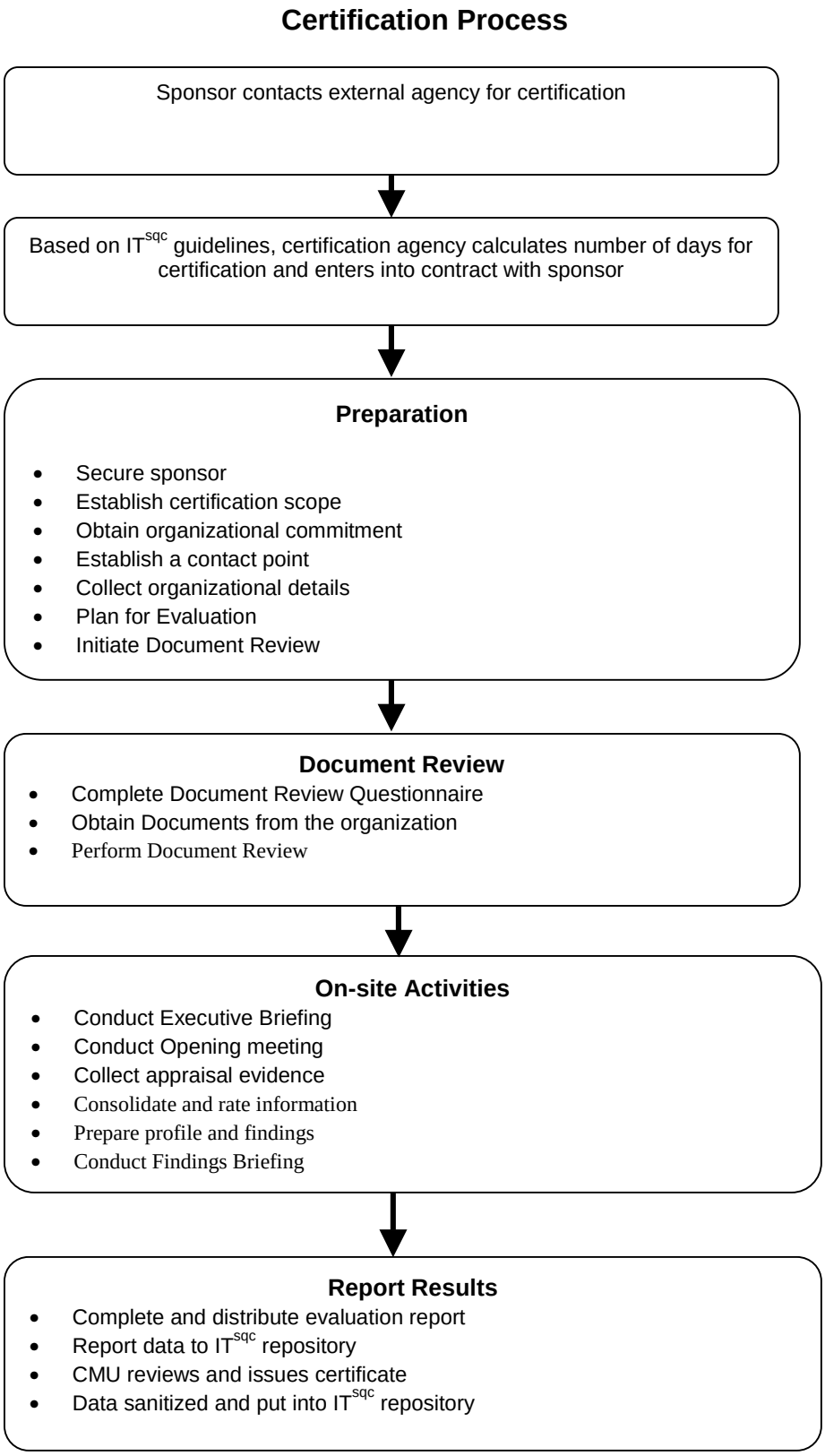
Rapid Capability Evaluation is a method of rapidly and economically measuring a provider's capability to provide IT-enabled outsourcing services. This method provides a consistent means of checking the status and progress of various capability improvement efforts in an organization. A Rapid Capability Evaluation is conducted by an evaluation team consisting of CMU-trained and authorized evaluators external to the organization, and is sponsored by the provider itself or other external entities, e.g., clients.

Rapid Capability Appraisal is a method of rapidly and economically checking the status of the improvement efforts undertaken, or as a means of determining the gap, for initiating improvement efforts using **e**$^{\mathbf{scm}}$ as the reference model. A Rapid Capability Appraisal is sponsored by the provider itself and may be performed by duly authorized appraisers, who may be either external or internal to the organization. These methods and training to be authorized to use these methods will be available from IT^{sqc} for use in the various IT-enabled outsourcing service segments.

While the detailed description of the appraisal process is addressed in a separate document, the **e**$^{\mathbf{scm}}$ appraisal handbook, we provide a very high level view here.

Evaluation for certification and other forms of appraisal may involve a single project or engagement, a site, multiple sites of the same organization addressing a specific segment, e.g., information services, and/or a specific sector, e.g., banking and finance or healthcare. The process for determining the scope of an evaluation is described in the **e**$^{\mathbf{scm}}$ appraisal handbook and is addressed in the method training course. Figure 4 contains an overview of the certification process.

Figure 4. Overview of the Certification Evaluation Process



The appraisal process for evaluation is comprised of four major activities that have been described at a high level in Figure 4. These are: (1) preparation, (2) document review, (3) on-site activities, and (4) reporting.

The various sources of data for appraisals include organization, document, and capability questionnaires; documents and other artifacts; interviews; and verification observations. An appraisal team uses the capability questionnaire analysis and ratings, and the document review ratings to identify issues needing further investigation through interviews and on-site verification. In addition, the information from capability questionnaires and document review are used to identify interview participants. Following interviews, additional clarifying information may be sought through on-site verification. On-site verification activities may include unobtrusive observation of service delivery, a tour of the provider's facilities, or additional artifact review, including seeing actual service logs.

The appraisal team consolidates the ratings from the capability questionnaire, document review, interviews, and verification activities and determines the capability rating for each of the 100 practices in the model. A practice-level profile is generated for use by the appraised organization and the sponsor. A capability level determination is made by the evaluation team, and is reported to the service provider and the sponsor, along with findings about areas of strength and capabilities that the service provider needs to improve. Results of the appraisal are reported to IT^{sqc} for inclusion in the repository. For certification evaluations, the data are rigorously reviewed and Carnegie Mellon issues a certificate of capability.

VIII. Summary

This document provides an overview of the **e**$^{\mathbf{scm}}$ model and a summary of the associated appraisal and evaluation methods. Included is an example set of Practice Descriptions that provide detailed information about the rationale, major activities, examples of major activities, related practices, and measures to be used in implementing the model. The descriptions are intended to provide additional details for clients and service providers who want to fully understand the model. A complete set of these practice descriptions is available from IT^{sqc}. This information will be used as the basis for model-based appraisals and evaluations. The evaluations will result in documentation of capabilities that CMU will use to determine certification status of service providers. The appraisals will give service providers the means to consistently and objectively determine their capabilities.

Interpretation of the practices of the **e**$^{\mathbf{scm}}$ may vary in different IT-enabled outsourcing segments. The **e**$^{\mathbf{scm}}$ will accommodate these varying characteristics by providing examples and benchmarks for the different outsourcing contexts within each segment. Benchmark information will be accessible through the IT^{sqc} repository that is being established at CMU and will have data collected from participating appraised organizations. In addition to providing status on state-of-the-art practices in IT-enabled outsourcing services, the Repository will also be used by IT^{sqc} to make changes, as necessary, to the **e**$^{\mathbf{scm}}$ model to reflect the dynamic nature of the outsourcing industry.

Additional documents to support use of the **e**$^{\mathbf{scm}}$ detailing the appraisal methods and measurement information are in preparation. Training on the use of the model and will be available through courses offered by IT^{sqc}. The **e**$^{\mathbf{scm}}$ framework and initial certification method will be available from CMU so that Satyam Computer Services Limited and other select agents may use it to determine service provider capability in several IT-enabled outsourcing service segments prior to the end of 2001. More information and details on the model is available at http://itsqc.srv.cs.cmu.edu. For information about becoming a partner or member of the consortium please contact Jane Siegel at escm@cs.cmu.edu. Following the References, are the glossary of terms used in the **e**$^{\mathbf{scm}}$ and the appendices of practices.

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Appendix A.

Comparison of Coverage with other Quality Models

Coverage[25] of **e**$^{\mathbf{scm}}$ compared to other quality models is shown in the next page. The following points summarize the major similarities and difference of **e**$^{\mathbf{scm}}$ with other quality models:

a) The highest overlap is in the service design stage of the contract execution activities.

b) Gaps addressed by **e**$^{\mathbf{scm}}$ are:

- Activities that lead to the formation of outsourcing relationship;
- The service deployment and delivery activities; and
- Activities that happen after the completion or termination of a contract.

c) **e**$^{\mathbf{scm}}$ defines a balanced level of structure that is adaptable to the dynamic nature of the IT-eos – neither too flexible/generic nor too rigid/specific.

The shaded areas in this matrix indicate practices from the **e**$^{\mathbf{scm}}$ that are not in scope for the other quality models.

[25]The comparative coverage was reviewed by authors of the SW-CMM, P-CMM, and by ISO auditors.

eSCM Coverage Matrix

OVERALL

Practices	ISO	MB	SW	P
Org. Mgmt				
Org_Over_1	1	2	0	0
Org_Over_2	2	0	1	1
Org_Over_3	1	2	1	1
Org_Over_4	1	1	1	1
Org_Over_5	2	2	2	0
Org_Over_6	2	0	2	1
Org_Over_7	1	2	0	0
Org_Over_8	1	2	0	0
Org_Over_9	1	2	0	0
Org_Over_10	0	0	0	0
Org_Over_11	0	1	0	0
Org_Over_12	0	0	1	1
Org_Over_13	2	0	1	1
People				
Ppl_Over_1	1	2	0	2
Ppl_Over_2	2	0	2	2
Ppl_Over_3	2	2	1	2
Ppl_Over_4	2	2	2	1
Ppl_Over_5	2	2	0	2
Ppl_Over_6	0	2	0	2
Ppl_Over_7	0	1	1	2
Ppl_Over_8	0	2	0	2
Ppl_Over_9	0	1	1	2
Ppl_Over_10	0	2	0	2
Ppl_Over_11	0	0	2	1
Ppl_Over_12	1	2	0	2
Ppl_Over_13	0	1	0	2
Bus Ops				
Ops_Over_1	2	0	2	0
Ops_Over_2	2	0	2	0
Ops_Over_3	1	0	0	0
Ops_Over_4	2	2	2	0
Ops_Over_5	2	2	2	0
Ops_Over_6	1	0	0	0
Technology				
Tech_Over_1	0	0	0	0
Tech_Over_2	0	0	0	0
Tech_Over_3	2	1	0	0
Tech_Over_4	0	0	0	0
Tech_Over_5	0	2	2	0
Know. Mgmt				
KM_Over_1	2	2	2	1
KM_Over_2	0	2	2	1
KM_Over_3	1	0	1	0
KM_Over_4	0	2	0	0
KM_Over_5	1	2	1	1
KM_Over_6	0	0	1	0
KM_Over_7	0	0	1	1
KM_Over_8	0	2	1	1
KM_Over_9	0	0	0	0

Pre-Contract

Practices	ISO	MB	SW	P
Org. Mgmt				
Org_Pre_1	0	0	0	0
Org_Pre_2	0	0	0	0
Org_Pre_3	1	0	0	0
People				
Ppl_Pre_1	0	0	0	1
Ppl_Pre_2	0	0	0	1
Bus Ops				
Ops_Pre_1	2	2	1	0
Ops_Pre_2	0	0	2	0
Ops_Pre_3	2	1	0	0
Ops_Pre_4	0	0	0	0
Ops_Pre_5	2	0	2	0
Ops_Pre_6	2	0	0	0
Ops_Pre_7	0	0	0	0
Technology				
Tech_Pre_1	0	0	0	0
Tech_Pre_2	0	0	0	0
Know. Mgmt				
KM_Pre_1	0	1	0	0
KM_Pre_2	0	1	0	0

Contract-Execution

Practices	ISO	MB	SW	P
Org. Mgmt				
Org_Exe_1	0	0	2	0
Org_Exe_2	1	1	0	0
Org_Exe_3	0	0	2	0
People				
Ppl_Exe_1	0	0	2	1
Ppl_Exe_2	2	0	2	2
Bus Ops				
Ops_Exe_1	1	2	2	0
Ops_Exe_2	2	0	2	0
Ops_Exe_3	2	0	2	0
Ops_Exe_4	2	0	2	0
Ops_Exe_5	1	0	2	0
Ops_Exe_6	0	0	2	0
Ops_Exe_7	2	0	2	0
Ops_Exe_8	0	2	1	0
Ops_Exe_9	2	0	2	0
Ops_Exe_10	2	0	0	0
Ops_Exe_11	2	2	0	0
Ops_Exe_12	0	2	0	0
Ops_Exe_13	2	2	0	0
Ops_Exe_14	1	0	0	0
Ops_Exe_15	0	0	0	0
Ops_Exe_16	2	1	2	0
Ops_Exe_17	1	1	2	0
Ops_Exe_18	0	0	1	0
Ops_Exe_19	2	2	0	0
Ops_Exe_20	2	2	0	0
Ops_Exe_21	1	1	0	0
Technology				
Tech_Exe_1	0	0	0	0
Tech_Exe_2	2	1	0	0
Know. Mgmt				
KM_Exe_1	0	0	1	2
KM_Exe_2	0	0	2	0
KM_Exe_3	0	0	1	0

Post-Contract

Practices	ISO	MB	SW	P
Org. Mgmt				
Org_Post_1	0	1	0	0
People				
Ppl_Post_1	1	0	0	1
Bus Ops				
Ops_Post_1	1	0	0	0
Ops_Post_2	0	1	0	0
Ops_Post_3	1	1	0	0
Technology				
Tech_Post_1	2	0	0	0
Know. Mgmt				
KM_Post_1	0	0	0	0

Legend

Rating Key

0	**Not in Scope**
1	**No Direct Coverage**
2	**Covered/Addressed**

Models Compared

ISO	**ISO 9001 : 2000**
MB	**Malcolm Baldrige 2001**
SW	**Software CMM Ver 1.1**
P	**People CMM Version 2.0**

Appendix B.

Glossary

Accessibility	The ability to gain access to technology infrastructure or information resources. Accessibility may be controlled through allocating appropriate “rights of use”.
Actions / Action items	Activities that are performed to accomplish an objective. They are in response to the analysis of results or findings from a reviewer monitoring or tracking the implementation of procedure(s), program(s) or practice(s).
Adequacy	Sufficiency to satisfy a requirement or meet a need.
Adverse situations	Unfavorable and unpredictable circumstances that adversely impact the organization’s ability to perform its planned activities. These situations can be natural, man-made, technological, or political.
Aggregate	To gather, collect or assemble data from one or multiple sources for analysis and decision-making.
Assign	To identify and allocate personnel for a defined role or task.
Audits	An (independent) examination of an activity, or set of activities, performed as a part of a procedure or program. The examination is carried out to assess compliance with defined specifications, policies, procedures, programs, standards, contractual agreements, or other criteria that are applicable to the organization.
Authority	The power assigned to enforce policies, and make decisions. This term is used in conjunction with the roles and associated responsibilities of the personnel in a service provider’s organization.
Benchmark	A standard against which measurements or comparisons can be made, with the intent to improve one's own capability.

Capability baselines	A description of the capability of the organization that is derived from the analysis of measures of performance of the **e**^{scm} practices.
Capability Levels	The five Capability Levels of **e**^{scm} describe an improvement path for a service provide. A provider may progress from a minimal level of having the capability to deliver service that meets client requirements, up to the highest level, sustaining value enhancement through continuous innovation. The five levels of capability that define this path are: Level 1 – Initial, Level 2 – Performing to meet client requirements, Level 3 – Controlling through measurement, Level 4 – Enhancing through innovation, and Level 5 – Sustaining excellence.
Career development	Actions, which provide opportunities for employees to develop new skills that enhance their ability to achieve career objectives. [1]
Change requests	Notification(s) for initiating changes to work products or service and technology components, from internal or external stakeholders.
Client	The organization that procures outsourced services from the service provider.
Client engagement	The entire duration of the relationship beginning with the service provider contacting the client or the client requesting a proposal, and ending with the handover of services after contract completion or termination.
Client interaction team	A team of personnel from the service provider, ideally representing multiple functions, constituted to interact with the client. This team primarily understands and captures clients' requirements and positions the service provider's capabilities, before the contract is finalized. They also provide clarifications to the service design team and to the client, during service design, and deployment phases, as required.
Client perceptions	The understanding or opinion held by clients about the service provider based on various characteristics of the service provided.
Closure	A predefined conclusion reached after executing planned actions and achieving the intended objectives.

Coaches	Coaches are experts helping to enhance the performance of individuals or teams.
Competence	The work performance that results from effectively applying skills, knowledge and personal attributes.
Competency	A cluster of knowledge, skills and process abilities that an individual should develop to perform a particular type of work in the organization. [1]
Comprehensiveness	Extent of coverage of the defined purpose of the practice.
Confidentiality	Restricting the use of information, service components, and technology components and work products, solely to authorized stakeholders.
Contract	A mutually binding agreement between two or more parties (client and a service provider), that is typically documented and enforceable by law.
Contract completion	The event of closure of a contract after the fulfillment of the contract obligations or expiration of the contract period.
Contract execution phase	The stages in the outsourcing process, which translate client requirements into deliverables according to service levels agreed upon in the contract. The two stages in the contract execution phase include service design and deployment, and service delivery and enhancement.
Context of use	The effectiveness, efficiency and satisfaction with which specific users can achieve specified goals in specified environments.
Cultural attributes	Characteristics of the client and end-user that are based on their culture, and impact the quality and acceptance of the service being delivered. Culture refers to the system of shared beliefs, values, customs, behaviors, and artifacts. Cultural attributes include ethnicity, language, and behavioral norms.
Cultural fit	To achieve cultural fit is to adapt the culture of the service provider to suit the culture of the client and/or end users.

Currency	Indicates the recency and status of up-dates, especially information and technology resources.
Cycle time	The total time required to complete an entire set of activities, including the time spent for actual work effort, storing, duplicating, reviewing, and reworking. [8]
Define and communicate	To describe the nature, basic qualities, purpose, and components of an aspect, e.g., a procedure or a policy, and convey them to concerned stakeholders.
Deployment of objectives	To translate and distribute the organizational objectives systematically, into objectives for each function, department, unit, team and individual within the organization.
Designate	To select and set aside personnel to perform a function, a duty, or tasks with a particular purpose.
Disaster recovery plan	An organization's plan for responding to adverse events that affects its ability to provide defined services. This includes identification of business and environmental events that can adversely affect the organization and its facilities and the potential damage that can be caused by such events; conducting a business impact analysis, such as cost of outage, and subjective impact analysis, on personnel morale, confidence, legal, social, corporate image, and financial credibility; defining and implementing preventive practices; and developing emergency response practices for responding to or stabilizing the situation following an adverse event.
Documentation	A collection of data, regardless of the medium on which it is recorded, that generally has permanence and can be read by humans or machines. [8]
Effectiveness	Indicates the capability to produce a planned result.
Efficiency	Indicates the degree to which a system or component performs its designated functions while optimizing usage of resources. [8]
Encryption	To alter a source of information, (a file, for example) using a secret code so as to make it unintelligible to unauthorized parties.

End user	The individual or group who will use the service provided by the service provider.
Ergonomics	The study of human capabilities and limitations, human interaction with technologies and environments, and the application of this knowledge to products, processes and equipment design for the workplace, so as to maximize productivity by reducing personnel fatigue and discomfort.
Escalation	The act of involving personnel from a higher level in the hierarchy of the service provider's or the client's organization, in order to draw their attention to an unresolved problem or a dispute and seek resolution.
Establish and Implement	To define, document, train personnel, provide resources and put to use a procedure with an aim of achieving intended outcomes.
External sources	The sources of data and information that lie outside the service provider's organization and include clients, subcontractors, vendors, the market, and society.
Extranet	An extension of an organization's intranet, especially over the World Wide Web, enabling communication between the organization and other external stakeholders, especially the client it deals with, often by providing limited access as required by the organization. [7]
Feasibility study	A structured analysis of the service provider's capabilities to determine the likelihood of accomplishing client requirements with existing or planned resources.
Feedback	Information obtained from internal and external stakeholders on the results of a procedure, program or activity, to understand, manage, control and improve performance.

Firewall	A firewall is a combination of hardware and software used to implement a security policy governing the network traffic between two or more networks, some of which may be under administrative control of the organization (e.g., the organization's networks) and some of which may be out of the organization's control (e.g., the Internet). A network firewall serves as a primary line of defense against external threats to the organization's computer systems, networks, and critical information. Firewalls can also be used to partition the organization's internal networks, to reduce risk from internal attacks. [9]
Function	A function is a specified type of work applied to a product or service moving within a process. Functions are described in the typical hierarchical organization chart, which in effect breaks down functions from the chief executive office of the enterprise through successive layers of management to the individual worker who touches the product or service, or who faces the customer. As work crosses functional boundaries, internal suppliers and internal customers are created, and responsibility for the resources and controls applied to the work changes hands. [8]
Guideline	An indication or outline based on organizational policy or conduct that provides guidance for determining a course of action.
Hand-Over	The act of relinquishing deliverables and resources to the client as part of completion of service or termination of service.
Implied / unstated needs	Client requirements that are not expressed explicitly. An organization uses its knowledge of the service segment / market sector to understand these needs.
Individual	This term has been used to specify single personnel in a service provider's organization.
Innovation	Innovation refers to making meaningful change to improve products, services, and/or processes and create new value for stakeholders. Innovation involves the adoption of an idea, process, technology, or product that is considered new or new to its proposed application. [11]

Institutionalization	The building of infrastructure and corporate culture that support methods, practices, and procedures so that they are the ongoing way of doing business, even after those who originally defined them are gone. [5]
Integrity	The state of being unimpaired i.e. soundness, and the quality or condition of being whole or undivided i.e. completeness [7]. Used in the context of 'service components' or 'technology infrastructure' or knowledge bases where to maintain integrity is to prevent alteration in quality, condition or purpose of the identified components either by unintentional acts, accidents or malicious attempts.
Intellectual property	A form of property that cannot be seen or touched, and which comes into existence through some kind of creative efforts. [6]
Intranet	A privately maintained computer network that can be accessed only by authorized personnel, including members or employees of the organization that owns it. [7]
IT- enabled outsourcing services (IT-eos)	Outsourcing services related to IT-intensive business processes or parts thereof. These services are typically provided over data or telecom networks. The organization providing the services may be externally contracted or maybe a remote subsidiary of the client.
Knowledge base	A collection of information or knowledge stored in any type of database or its offshoots that is of interest to the organization and made accessible to its personnel. [3]
Legal action	A judicial proceeding brought by one party against another for a fault or for protection of its rights or for preventing a malicious intent. [7]
Liabilities	Something for which one is responsible; an obligation, or debt. [7]
Licensing	An authorization given by an official or a legal authority to an individual or organization to own or use a specific technology. [8]

Local Area Network (LAN)	A system that links together electronic equipments such as computers and applications, and forms a network within an organization. [7]
Market sector	The nature of business of the client is categorized as the market sector. The Standard Industry Classification (SIC) provides a classification scheme for market sectors. Examples are banking and finance or health care.
Measures of performance	The set of definitions, methods, and activities used to measure the performance of the procedures, programs, practices, and their resulting products for the purpose of characterizing and controlling and improving them.
Media	Materials that hold data in any form or that allow data to pass through them, including paper, transparencies, multipart forms, hard, floppy and optical disks, magnetic tape, wire, cable and fiber. Media is the plural of "medium."
Mentor	Mentors are experienced members of the organization providing personal support and guidance to less experienced members of a team.
Method	A method is an organized approach based upon applying a technique. A method involves a technique and a set of guidelines about how and when to apply the technique. It also may indicate when the technique is appropriate and how to evaluate it. [8]
Milestone	A scheduled event for which an individual, team, or organization is accountable. It is used to measure progress. [5]
Monitoring	Keeping track at predefined frequencies about planned versus actual performance for the purpose of management and control of an activity.
Negotiation	The act of identifying the key business and legal issues, and discussing their resolution with the intent of structuring a formal relationship.

Network	A system that transmits any combination of voice, video and/or data between users. The network includes the network operating system for the client and server machines, the cables connecting them and all supporting hardware in between such as bridges, routers and switches. In wireless systems, antennas and towers are also part of the network. [7]
Non-compliance	Instances of non-adherence to an organizational policy, guideline or procedure or to external standards, conventions or regulations that are applicable to the organization. (This term may be used interchangeably with non-conformance.)
Objective criteria	A standard, policy, procedure, or rule that minimizes subjectivity and bias when judgments or decisions are made.
Organization	Please see 'Service Provider'
Organizational elements	Five fundamental aspects of an organization, which need to work as a system across the outsourcing process to ensure the establishment, management, and expansion of outsourcing relationships. These are: (1) Organizational Management, (2) People, (3) Business Operations, (4) Technology, and (5) Knowledge Management.
Orientation	An overview or introduction to a topic for those overseeing or interacting with individuals performing activities for service delivery. [5]
Overall practices	**e**$^{\textbf{scm}}$ practices defined for an Organizational element, that are applicable across all the phases, i.e., Precontract, Contract Execution and Postcontract phases of the outsourcing process.
Peer review	Review of an item or work products, by persons who have equal standing with another in role, rank, class, or age in the organization, for the purpose of identifying defects or improvements.
Person-hours	An industrial unit of production equal to the work one person can produce in one hour. [7]

Phase-specific Practices	**e**^{scm} practices that are defined for on Organizational element, and are applicable in a specific phase of the outsourcing process, i.e., either in the Precontract phase, the Contract Execution phase or the Postcontract phase.
Policy	A guiding principle, typically established by the organization's leadership that is adopted by the organization to influence and determine decisions. [5]
Postcontract phase	Comprises the stages in the outsourcing process wherein, due to the completion or termination of a contract, the service provider transitions the service back to the client. This hands over service related assets, developed or provided by the client, to the client according to contractual terms.
Practice	Component of the **e**^{scm} model derived from the guiding principles of the model and defined for each organizational element of the model. Service providers implement practices to improve their capability to manage and expand relationships with their client(s).
Practice rating	The process of determining the effectiveness of implementation and institutionalization of an **e**^{scm} practice. Data are collected and analyzed according to the **e**^{scm} appraisal methods.
Precontract phase	Comprises the stage in the outsourcing process that involves activities that are performed until finalization of the contract between the service provider and the client, e.g., understanding client requirements, negotiating deliverables, and assessing internal capabilities. The stages in the precontract phase include Requirement Management and Contract Finalization.
Pricing models	A defined set of principles, guidelines and methods used by the organization to determine the price for a specified service for a client. A few examples of pricing models include fixed price, cost plus, management fee, hourly fee, performance linked, gain sharing, and value based.
Principle	A fixed or predetermined policy or a statement of intent that specifies a desired outcome.

Procedure	A documented description of an approach to be taken to perform a defined set of tasks required for achieving an intended result. [5]
Process specification	This specification contains the methods to be used in the service delivery process, including: (a) a clear description of service delivery characteristics that directly affect service performance, (b) a standard of acceptability for each service delivery characteristic, and (c) resource requirements detailing the type and quality of people, equipment, and facilities necessary to fulfill the service specification. [4]
Productivity	A measure of the efficiency and effectiveness of the use of all resources during the development of a product or service through to its delivery. [8]
Program	A set of actions or projects initiated with defined resource commitments and timelines for completion that an organization implements to achieve a defined organizational objective.
Proposal	An offer, promise, or other manifestation of willingness to make and fulfill a contract or to bargain under proposed terms with another party that has the power to accept the proposal.
Prospective client	An organization that is likely to become a client of the service provider in the future.
Prototype	Refers to any artifact created for the purpose of demonstrating a proof-of-concept to a client and/or end users in order to elicit or test user feedback.

Quality specification	A quality specification is a set of criteria for evaluating and controlling a service, and service delivery characteristics. This specification enables effective control of each service process to ensure that the service consistently satisfies the service specification and the client. A quality specification involves: (a) key characteristics in each process that have a significant influence on the specified service; (b) methods for evaluating the selected characteristics; (c) the means to influence or control the characteristics within the specified limits; and, (d) measurement and verification of the characteristics to avoid undesirable trends and customer dissatisfaction. [4]
Rationale	Explains the reasons for a practice in the **e**^{scm}, and describes the benefits achieved by the service provider, and the value provided to the client, by implementation of that practice.
Regulatory requirements	Requirements that are specified in 'Regulations' formulated and enforced by authorities in the state or country of the Service Provider and/or the Client. Such regulations typically require the performance or non-performance of specific activities and apply to the service segments or market sectors serviced by the service provider. Regulations are not statutes or laws by themselves, but are typically enforceable by law.
Reliability	Refers to the ability of a service or technology component, to perform its required functions under given conditions for a specified period of time.
Remediation	The act or process of correcting a fault or a deficiency.
Resources	Personnel, technology, capital, and money required to perform service-related or support activities.
Resource augmentation	The act or process of adding resources based on identified needs of the organization's objectives or the requirements of clients.
Resource management	The identification, estimation, allocation, monitoring, and control of the means used to develop a product or perform a service. [8]

Responsibilities	An action or course of action that is required by a person to fulfill the role assigned to the person.
Requirement specification	The elicitation and documentation of stated and implied client requirements.
Result	Outcomes achieved by an organization from implementing a practice defined in the **e**$^{\textbf{scm}}$. Results are evaluated on the basis of current performance compared with rate, breadth, and importance of performance improvements; and relationship of results measures to key organizational performance requirements. [11]
Review	A formal examination of [meeting] a service or product by end-users, clients, or other interested parties for comment and approval. It can also be a review of an organization, management, and technical activities, and of progress of a contract. [5]
Risk	Events with a probability of occurrence and a potential for loss, that affect the ability to meet client requirements within defined cost, schedule, and technical constraints.
Risk analysis	A technique to identify and assess factors that may jeopardize the success of a project or achievement of a goal. This technique also helps define preventive measures to reduce the probability of their occurrence and to identify countermeasures to successfully deal with these constraints when they develop.
Risk management	An approach to problem analysis that weighs risk in a situation by using risk probabilities to determine a more accurate understanding of the risks involved. Risk management includes risk identification, analysis, prioritization, and control. [5]
Risk tolerance	The ability of an organization to absorb the impact of occurrence of risks.
Role	A unit of defined responsibilities that may be assumed by one or more individuals. [1]. A role is typically assigned to an individual within the organization.
Schedule	The time budgeted for accomplishing the goals for the tasks at hand. [8]

Security	The protection of organizational assets, both physical and electronic, against inappropriate and unauthorized access or loss.
Service characteristics	The features of the service that impact the performance of the delivered service. Service characteristics include: service accessibility and availability, quality of personnel interactions, service safety, security, reliability, service delay, duration, delivery times, service capacity, size of service delivery facilities, and quantity and types of service-related supplies and materials.
Service component	A service component is an identified part of the service being delivered or a support activity, typically placed under change or version control, to identify any changes made during service delivery. Usually, a component provides a particular function or group of related functions. Components of service design include, specific user interfaces, customized software, data storage mechanisms, and other information required to perform service delivery and implement security mechanisms. These components can change during the delivery of service. (Service specification and project plan do not form a part of service components).
Service customization	To alter or modify the service according to specific requirements.
Service delivery	The process of performing required activities, as specified in the service design, in order to deliver the service according to contract requirements. This is typically a repetitive or continuous activity.
Service deployment	The process of acquiring or installing required infrastructure including technology, and deploying appropriately skilled people, based on the service design, in order to deliver the desired service. This includes identifying, obtaining, preparing and setting up necessary resources.

Service design	The process of designing the service, including: the delivery process, required people skills and technology, and the means to monitor and control service quality, based on client requirements and service levels defined in the contract. In certain cases of outsourcing this involves transitioning and improving the existing service delivery process to levels agreed with the client.
Service levels	The performance values expected for service delivery during an engagement. For example, bandwidth availability, response times for routine and ad hoc queries, response time for problem resolution (e.g., network down time, machine failure) as well as attitudes and consideration of the technical staff.
Service provider	Refers to the entity providing IT-enabled outsourcing services to client(s). An entity is a company, corporation, firm, enterprise or association, or part thereof, whether incorporated or not, public or private, that has its own function (s) and administration. [4]
Service recovery	The act of restoring the service after the occurrence of an event leading to failure in meeting service commitments.
Service-related activities	The activities performed during the stages of service design, deployment and delivery that directly affect the service.
Service segments	A classification of different IT enabled outsourcing services provided based on the nature of service provided. IT^{sqc} maintains an up to date list of the standard service segments.
Service specifications	A service specification defines the characteristics of the service to be provided including a precise statement of the service: (a) a clear description of the service characteristics subject to customer evaluation, and (b) a standard of acceptability for each service characteristic. [4]
Service Transition	Process of transfer of responsibility for providing the service, from the client to the service provider, which may be accompanied by transfer of assets, including personnel from the client.

Simulation	Representation of an operation or features of a designed service through the act of imitating or replicating the real service in an artificial environment.
Skill	The performance abilities, including talent and proficiency, which must be developed to perform a task or activity successfully. Skills may involve behaviors to directly accomplish the task or to support or coordinate with others to help accomplish tasks. [1]
Skill inventory	A repository that contains systematically organized information on employee skills.
Stakeholders	A group of individuals who are affected by or are in some way accountable for the outcome of an undertaking. It is comprised of clients, business partners, shareholders, and employees of an organization.
Statutory requirements	An established law or rule, as of a corporation, state or union, that is stated as a requirement with mandated adherence by an organization.
Support activities	The activities performed to enable performance monitoring and control of the stages of service design, deployment and delivery to ensure that the services meet the requirements and adhere to the plan. The support activities can be in the form of providing resources, or performing verification, validation, review and change management.
Subcontractors	An individual, partnership, corporation, or association that contracts with a service provider (i.e., the prime contractor) to design, develop, and/or deploy a service or part thereof. [5]
System	A system is a combination of physical equipment, computer software, documentation, personnel, tasks, and organizational or management procedures that provide specified functionality.
Task	In project management, the smallest unit of work subject to management accountability. A task contains a well-defined work assignment for one or more team members.

Team	A group of people who work closely together to achieve shared objectives, work together on tasks that are highly interdependent, and may exercise a level of autonomy in managing their activities in pursuit of those objectives. Team members may participate on the team part time and have other primary responsibilities. [1]
Technology infrastructure	Software, hardware, and telecommunication facilities required for providing IT-enabled outsourcing services.
Template	A document or file having a preset format that is used as a starting point for a particular application so that the format does not have to be re-created each time it is used. [7]
Termination	A contract is terminated, either by the client or the service provider, before the planned contract completion date.
Timeframe	A period during which something takes place or is scheduled to occur. [7]
Traceability	The degree to which a relationship can be established between two or more components, especially components having a predecessor-successor or master-subordinate relationship to one another. This also applies to related documentation. [5]
Track and control	Monitoring the performance of actual activities against planned activities, identifying and managing any observed deviations.
Train	To make a person proficient through specialized instruction and practice. [5]
Training programs	The set of related elements that address an organization's training needs. It includes an organization's training plan, training materials, development of training, conduct of training, training facilities, evaluation of training, and maintenance of training records.
Undetected intrusions	An inappropriate or unwelcome happening that is neither predicted nor perceived, and is done with a malicious intent to cause damage to a service provider’s technology and information resources.

Usability	The ease of use and acceptability of a system or product or service for a particular category of users who are carrying out specific tasks in a specific environment; where ‘ease of use’ affects user performance and satisfaction, and ‘acceptability’ affects whether or not it is used.
User related knowledge	Information or knowledge regarding key characteristics of the end-user of the service that may influence the service design, development and delivery.
Validation	The process of evaluating a service, service component and results of performance measures, at the end of its development activities, to determine whether or not it satisfies the requirements of the client.
Vendor	An individual, partnership, corporation, or association that contracts with a service provider to deliver a product or service, i.e., software, hardware, equipment, and miscellaneous items.
Verification	The process of evaluating a procedure or program, to determine whether or not the results satisfy the conditions imposed, at their initiation.
Vulnerability	Susceptibility to damage or loss, of a service provider’s technology and information resources.
Work products	A document, piece of information, product or other item which acts as input to or output from one or a set of activities. Examples include service specifications, project plans.

Glossary Sources:

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[6] Burnett, Rachel.(1998) Outsourcing IT – The Legal Aspects. Gower Publishing Limited, pgs.121

[7] www.dictionary.com (Terms modified from this source.)

[8] European Software Institute. Bestwords Dictionary of Software. http://www.esi.es/Help/dictionary.html (Terms modified from this document.)

[9] CERT® Coordination Center. A CERT® Security Improvement Module. http://www.cert.org/security-improvement/modules/m08.html (Terms modified from this document.)

[10] CMMI Product Development Team. CMMI[SM] for Systems Engineering/Software Engineering/Integrated Product and Process Development, Version 1.02. Pittsburgh, PA, Software Engineering Institute (Terms modified from this document.)

[11] Baldrige National Quality Program. Criteria for Performance Excellence – 2001. Gaithersburg, MD, NIST (Terms modified from this document.)

Appendix C.

Principle to Practice Mapping

Principle / Practice	Adopting a Systems Perspective	Communicating effectively with all stake holders	Building confidence and trust with all stake holders	Managing by measures	Improving continuously and being client centered	Fostering an innovative and responsive culture	Enhancing value to all stake holders
Org_Over_1	✓	✓	✓	✓	✓	✓	✓
Org_Over_2	✓	✓	✓	✓	✓		
Org_Over_3	✓	✓	✓	✓	✓	✓	✓
Org_Over_4	✓	✓	✓	✓	✓		
Org_Over_5	✓	✓	✓	✓	✓	✓	✓
Org_Over_6	✓	✓	✓	✓	✓		
Org_Over_7	✓	✓	✓	✓	✓	✓	✓
Org_Over_8	✓	✓	✓	✓	✓	✓	✓
Org_Over_9	✓	✓	✓	✓	✓		
Org_Over_10	✓	✓	✓	✓	✓		
Org_Over_11	✓	✓	✓				
Org_Over_12	✓	✓	✓	✓	✓	✓	✓
Org_Over_13	✓	✓	✓	✓	✓		
Org_Pre_1	✓	✓	✓	✓	✓		
Org_Pre_2	✓	✓	✓				
Org_Pre_3	✓	✓	✓				
Org_Exe_1	✓	✓	✓				
Org_Exe_2	✓	✓	✓				

Principle / Practice	Adopting a Systems Perspective	Communicating effectively with all stake holders	Building confidence and trust with all stake holders	Managing by measures	Improving continuously and being client centered	Fostering an innovative and responsive culture	Enhancing value to all stake holders
Org_Exe_3	✓	✓	✓	✓	✓		
Org_Post_1	✓	✓	✓	✓	✓		
Ppl_Over_1	✓	✓	✓	✓	✓		
Ppl_Over_2	✓	✓	✓	✓	✓		
Ppl_Over_3	✓	✓	✓				
Ppl_Over_4	✓	✓	✓				
Ppl_Over_5	✓	✓	✓	✓	✓		
Ppl_Over_6	✓	✓	✓				
Ppl_Over_7	✓	✓	✓	✓	✓	✓	✓
Ppl_Over_8	✓	✓	✓	✓	✓		
Ppl_Over_9	✓	✓	✓	✓	✓		
Ppl_Over_10	✓	✓	✓	✓	✓	✓	✓
Ppl_Over_11	✓	✓	✓	✓	✓	✓	✓
Ppl_Over_12	✓				✓	✓	✓
Ppl_Over_13	✓	✓	✓	✓	✓		
Ppl_Pre_1	✓	✓	✓				
Ppl_Pre_2	✓	✓	✓				
Ppl_Exe_1	✓	✓	✓				
Ppl_Exe_2	✓	✓	✓				
Ppl_Post_1	✓	✓	✓				
Ops_Over_1	✓	✓	✓				

Principle / Practice	Adopting a Systems Perspective	Communicating effectively with all stake holders	Building confidence and trust with all stake holders	Managing by measures	Improving continuously and being client centered	Fostering an innovative and responsive culture	Enhancing value to all stake holders
Ops_Over_2	✓	✓	✓				
Ops_Over_3	✓	✓	✓				
Ops_Over_4	✓	✓	✓	✓	✓		
Ops_Over_5	✓	✓	✓	✓	✓	✓	✓
Ops_Over_6	✓	✓	✓				
Ops_Pre_1	✓	✓	✓				
Ops_Pre_2	✓	✓	✓	✓	✓		
Ops_Pre_3	✓	✓	✓				
Ops_Pre_4	✓	✓	✓				
Ops_Pre_5	✓	✓	✓				
Ops_Pre_6	✓	✓	✓				
Ops_Pre_7	✓	✓	✓				
Ops_Exe_1	✓	✓	✓	✓	✓		
Ops_Exe_2	✓	✓	✓				
Ops_Exe_3	✓	✓	✓				
Ops_Exe_4	✓	✓	✓				
Ops_Exe_5	✓	✓	✓				
Ops_Exe_6	✓	✓	✓				
Ops_Exe_7	✓	✓	✓				
Ops_Exe_8	✓	✓	✓				
Ops_Exe_9	✓	✓	✓	✓	✓		

Principle / Practice	Adopting a Systems Perspective	Communicating effectively with all stake holders	Building confidence and trust with all stake holders	Managing by measures	Improving continuously and being client centered	Fostering an innovative and responsive culture	Enhancing value to all stake holders
Ops_Exe_10	✓	✓	✓	✓	✓		
Ops_Exe_11	✓	✓	✓				
Ops_Exe_12	✓	✓	✓	✓	✓		
Ops_Exe_13	✓	✓	✓				
Ops_Exe_14	✓	✓	✓				
Ops_Exe_15	✓	✓	✓				
Ops_Exe_16	✓	✓	✓				
Ops_Exe_17	✓	✓	✓				
Ops_Exe_18	✓	✓	✓	✓	✓		
Ops_Exe_19	✓	✓	✓				
Ops_Exe_20	✓	✓	✓				
Ops_Exe_21	✓	✓	✓				
Ops_Post_1	✓	✓	✓				
Ops_Post_2	✓	✓	✓				
Ops_Post_3	✓	✓	✓	✓	✓		
Tech_Over_1	✓	✓	✓				
Tech_Over_2	✓	✓	✓				
Tech_Over_3	✓	✓	✓				
Tech_Over_4	✓	✓	✓	✓	✓	✓	✓
Tech_Over_5	✓	✓	✓				
Tech_Pre_1	✓	✓	✓	✓	✓		

Principle / Practice	Adopting a Systems Perspective	Communicating effectively with all stake holders	Building confidence and trust with all stake holders	Managing by measures	Improving continuously and being client centered	Fostering an innovative and responsive culture	Enhancing value to all stake holders
Tech_Pre_2	✓	✓	✓				
Tech_Exe_1	✓	✓	✓				
Tech_Exe_2	✓	✓	✓	✓	✓		
Tech_Post_1	✓	✓	✓				
KM_Over_1	✓	✓	✓	✓	✓		
KM_Over_2	✓	✓	✓	✓	✓	✓	✓
KM_Over_3	✓	✓	✓	✓	✓	✓	✓
KM_Over_4	✓	✓	✓	✓	✓	✓	✓
KM_Over_5	✓	✓	✓				
KM_Over_6	✓	✓	✓	✓	✓		
KM_Over_7	✓	✓	✓	✓	✓		
KM_Over_8	✓	✓	✓	✓	✓	✓	✓
KM_Over_9	✓	✓	✓	✓	✓	✓	✓
KM_Pre_1	✓	✓	✓	✓	✓		
KM_Pre_2	✓	✓	✓	✓	✓		
KM_Exe_1	✓	✓	✓	✓	✓	✓	✓
KM_Exe_2	✓	✓	✓	✓	✓		
KM_Exe_3	✓	✓	✓				
KM_Post_1	✓	✓	✓	✓	✓	✓	✓

Appendix D.

Practices by Capability Levels

Level 2

Organizational Management

I. OVERALL PRACTICES (Org_Over_*)

1. Define and communicate organizational objectives.

11. Define the organization's policies on security and confidentiality and communicate them to stakeholders.

II. PHASE SPECIFIC PRACTICES

A. Precontract (Org_Pre_*)

Requirements Management

None

Contract Formulation

2. Define guidelines for pricing services.
3. Establish and implement procedures for formulating and amending contracts.

B. Contract Execution (Org_Exe_*)

Service Design and Deployment

1. Establish and implement procedures for communicating the client's requirements from the client interaction team to the service design and deployment team.
3. Plan and implement practices to manage risks specific to the contract.

Service Delivery and Enhancement

None

C. Postcontract

Transition

None

People

I. OVERALL PRACTICES (Ppl_Over_*)

3. Assign roles and responsibilities to personnel based on appropriate skills.
4. Plan to meet identified needs by providing training or acquiring personnel.
6. Establish and maintain a work environment that enables the personnel to work effectively.

II. PHASE SPECIFIC PRACTICES

A. Precontract (Ppl_Pre_*)

Requirements Management

1. Designate teams to understand the prospective client's requirements and position the organization's capabilities.

Contract Formulation

2. Designate a team to negotiate with clients.

B. Contract Execution (Ppl_Exe_*)

Service Design and Deployment

1. Designate personnel or teams to design and deploy the service according to client requirements.
2. Identify the skills which are needed to meet specific client requirements.

Service Delivery and Enhancement

None

C. Postcontract (Ppl_Post_*)

Transition

1. Maintain an inventory of skills which are being transferred to the client during reverse transition.

Business Operations

I. OVERALL PRACTICES (Ops_Over_*)

1. Establish and implement procedures for selecting subcontractors and vendors based on their ability to meet identified requirements.
2. Monitor the performance of subcontractors and vendors against their commitments, and take appropriate action.
3. Establish and implement procedures for capturing interactions with clients.
6. Establish and implement procedures to meet a client's requirements for confidentiality, security, and protection of intellectual property.

II. PHASE SPECIFIC PRACTICES

A. Precontract (Ops_Pre_*)

Requirements Management

1. Establish and implement procedures to capture a client's requirements.
3. Establish and implement procedures to identify and update contract applicable statutory and regulatory requirements.
4. Define the roles and responsibilities of the organization and the client with respect to the proposed engagement.
5. Review client requirements and ensure that the organization can meet them, using present or planned organizational capabilities
6. Establish and implement procedures for responding to the requirements of a prospective client.

Contract Formulation

7. Prior to negotiation, identify key issues requiring client agreement.

B. Contract Execution (Ops_Exe_*)

Service Design and Deployment

2. Develop service specifications.
3. Define a plan to design and deploy the service.
4. Define and communicate service expectations to subcontractors and vendors.
5. Design and deploy the service based on the service specification.
6. Track service design and deployment activities against the plan at designated intervals.
7. Define process specifications for the delivery of service.
8. Define quality specifications to monitor the quality of the service delivered.
11. Establish and implement procedures to get feedback from the client on the designed service, and to incorporate necessary changes.
13. Establish and implement procedures to verify and account for resources transferred from the client to the organization.

Service Delivery and Enhancement

14. Plan and deliver the service according to the defined process.
15. Track the service delivery activities against the plan, and take corrective action as required.
16. Monitor service quality according to defined standards for quality.
17. Establish and implement procedures to periodically track service levels achieved, compare them to commitments made to clients, and take corrective action.
19. Establish and implement procedures to identify the components of the service being offered and track and control changes made to them.
20. Establish and implement procedures for making modifications to services.
21. Establish and implement procedures for training clients and end-users as required in the agreement with the client.

C. Postcontract (Ops_Post_*)

Transition

1. Establish and implement procedures for handing over resources during contract completion and termination.
2. Obtain and analyze client feedback when a contract is terminated.

Technology

I. OVERALL PRACTICES (Tech_Over_*)

1. Establish and implement procedures to track and control changes in the technology infrastructure.
2. Establish and implement procedures to manage the security of the technology infrastructure.
3. Establish and implement procedures for acquiring, deploying, and upgrading technology.
5. Establish and implement procedures to identify the potential for, the response to, and the recovery from, adverse situations which affect the ability of the organization to provide service.

II. PHASE SPECIFIC PRACTICES

A. Precontract (Tech_Pre_*)

Requirements Management

None

Contract Formulation

2. Incorporate the licensing of technology as part of agreements made with clients.

B. Contract Execution (Tech_Exe_*)

Service Design and Deployment

1. Establish and implement procedures to integrate an organization's technology infrastructure with that of the client, as appropriate.

Service Delivery and Enhancement

None

C. Postcontract (Tech_Post_*)

Transition

1. Establish and implement procedures to transfer technology licenses and intellectual property during reverse transition.

Knowledge Management

I. OVERALL PRACTICES (KM_Over_*)

5. Identify, control, and make available the information required to implement activities defined in the organization's procedures.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management

None

Contract Formulation

None

B. Contract Execution (KM_Exe_*)

Service Design and Deployment

None

Service Delivery and Enhancement

3. Establish and implement procedures to capture and analyze data on resources consumed during contract execution.

C. Postcontract

Transition

None

Level 3

Organizational Management

I. OVERALL PRACTICES (Org_Over_*)
2. Define and communicate the roles, responsibilities, and authority of personnel in the organization.
4. Establish and implement procedures, at appropriate levels in the organization, for periodically reviewing the organization's performance.
6. Identify and provide adequate resources for performing service-related and support activities.
9. Establish and implement procedures to collect and disseminate knowledge about clients and end-users.
10. Define a risk management policy.
13. Establish and implement procedures to verify whether procedures are being executed as planned.

II. PHASE SPECIFIC PRACTICES
A. Precontract (Org_Pre_*)
Requirements Management
None
Contract Formulation
1. Define guidelines for negotiations with potential or existing clients.

B. Contract Execution (Org_Exe_*)
Service Design and Deployment
2. Determine the specific cultural attributes that are required to provide the intended service, and initiate actions to achieve a cultural fit.
Service Delivery and Enhancement
None

C. Postcontract (Org_Post_*)
Transition
1. Establish and implement procedures to ensure the continuity of service during contract completion or contract termination.

People

I. OVERALL PRACTICES (Ppl_Over_*)
1. Identify the personnel competencies needed to achieve organizational objectives.
2. Develop the personnel competencies which are needed to achieve organizational objectives.
5. Evaluate the effectiveness of the training in achieving its intended objectives.
8. Establish and implement procedures that enable individuals and teams to participate in decisions that affect their work commitments.
9. Define and implement a reward system that encourages the achievement of organizational objectives.
13. Establish and implement procedures for appraising individual and team performance.

II. PHASE SPECIFIC PRACTICES
A. Precontract
Requirements Management
None
Contract Formulation
None

B. Contract Execution (Ppl_Exe_*)
Service Design and Deployment
None
Service Delivery and Enhancement
None

C. Postcontract
Transition
None

Business Operations

I. OVERALL PRACTICES (Ops_Over_*)
4. Provide remediation to prevent reoccurrence of identified problems.

II. PHASE SPECIFIC PRACTICES
A. Precontract (Ops_Pre_*)
Requirements Management
2. Identify and assess contract-specific risks.
Contract Formulation
None

B. Contract Execution (Ops_Exe_*)
Service Design and Deployment
1. Establish and implement procedures to design and deploy the service to meet client requirements.
9. Develop the organization's response to anticipated failures in the delivery of service.

10. Establish and implement procedures to review the designed service.
12. Validate the service design against client requirements.

Service Delivery and Enhancement

18. Establish and implement procedures to get feedback from the client at designated milestones.

C. Postcontract (Ops_Post_*)

Transition

3. Establish and implement procedures for getting feedback from clients and end-users, and analyzing problems after the contract is completed or terminated.

Technology

I. OVERALL PRACTICES

None

II. PHASE SPECIFIC PRACTICES

A. Precontract (Tech_Pre_*)

Requirements Management

1. Define the effort needed and time required for upgrading or acquiring new technology when responding to client requirements.

Contract Formulation

None

B. Contract Execution (Tech_Exe_*)

Service Design and Deployment

None

Service Delivery and Enhancement

2. Monitor and measure the performance of the technology infrastructure that is needed to deliver the service according to agreed upon service levels.

C. Postcontract

Transition

None

Knowledge Management

I. OVERALL PRACTICES (KM_Over_*)

1. Identify, collect, and furnish performance measures for established procedures and programs.
6. Establish and implement procedures for the capture, analysis, and dissemination of knowledge gained from client engagements.
7. Establish and implement procedures to identify, collect, and reuse work products and service components.

II. PHASE SPECIFIC PRACTICES

A. Precontract (KM_Pre_*)

Requirements Management

1. Capture and organize client requirements in a knowledge base.
2. Establish and implement procedures for collection, validation, and dissemination of market information about prospective clients.

Contract Formulation

None

B. Contract Execution (KM_Exe_*)

Service Design and Deployment

None

Service Delivery and Enhancement

2. Capture competencies used and developed during contract execution.

C. Postcontract

Transition

None

Level 4

Organizational Management

I. OVERALL PRACTICES (Org_Over_*)

3. Plan and implement programs for achieving organizational objectives.
5. Utilize lessons learned from performance reviews to identify opportunities for improvement.
7. Establish and implement procedures for developing and managing relationships with clients and prospective clients.
8. Establish and implement procedures to understand the perceptions that current and prospective clients have about the organization and its services.
12. Establish and implement procedures to verify whether programs for achieving organizational objectives are being executed as planned.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management
None

Contract Formulation
None

B. Contract Execution

Service Design and Deployment
None

Service Delivery and Enhancement
None

C. Postcontract

Transition
None

People

I. OVERALL PRACTICES (Ppl_Over_*)

7. Provide personnel with opportunities to develop the skills they need for their career development.
10. Get feedback from personnel and utilize it for organizational improvement.
11. Support innovation and entrepreneurship by personnel in their approach to achieving organizational objectives.
12. Designate a team responsible for monitoring technological innovations and introducing appropriate technologies into the organization.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management
None

Contract Formulation
None

B. Contract Execution

Service Design and Deployment
None

Service Delivery and Enhancement
None

C. Postcontract

Transition
None

Business Operations

I. OVERALL PRACTICES (Ops_Over_*)

5. Proactively identify potential problems and implement preventive actions to preclude their occurrence.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management
None

Contract Formulation
None

B. Contract Execution

Service Design and Deployment
None

Service Delivery and Enhancement
None

C. Postcontract

Transition
None

Technology

I. OVERALL PRACTICES (Tech_Over_*)

4. Establish and implement procedures to identify and introduce appropriate technology.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management

None

Contract Formulation

None

B. Contract Execution

Service Design and Deployment

None

Service Delivery and Enhancement

None

C. Postcontract

Transition

None

Knowledge Management

I. OVERALL PRACTICES (KM_Over_*)

2. Define capability baselines for the organization by analyzing performance data.
3. Establish and implement procedures to validate the results of performance measures.
4. Analyze comparative data from external and internal sources and use it to benchmark organizational performance.
8. Establish and implement procedures for sharing knowledge among stakeholders.
9. Define mechanisms to address the queries that personnel may have on service-related issues.

II. PHASE SPECIFIC PRACTICES

A. Precontract

Requirements Management

None

Contract Formulation

None

B. Contract Execution (KM_Exe_*)

Service Design and Deployment

1. Capture innovative approaches in service design and deployment.

Service Delivery and Enhancement

None

C. Postcontract (KM_Post_*)

Transition

1. Establish and implement procedures to transfer to the client, during reverse transition, the knowledge gained from the specific client engagement.