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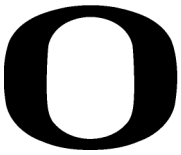

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Benefits of an ITIL Transition in Small to Medium Sized Enterprises

CAPSTONE REPORT

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Abstract

Small and medium sized enterprises (SMEs) are subject to the same complex computing requirements as their larger counterparts (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). With ever increasing complexity and cost associated with operating systems that are necessary today, SMEs need to learn how to do more with less. Tools exist today to help IT departments track issues and be more efficient with their spending through the use of the Information Technology Infrastructure Library.

Keywords: Small and Medium Sized Enterprises, SME, ITIL, IT Infrastructure Library, ITSM, IT Service Management, Critical Success Factors, Small and Medium Sized Businesses

Table of Contents

Abstract 3

Introduction to the Annotated Bibliography 7

Statement of the Problem 7

Purpose Statement 9

Research Questions 9

Intended Audience 9

Search Report 10

Reference Evaluation Criteria 12

Annotated Bibliography 14

Introduction 14

IT Service Management 14

Benefits of ITIL 22

ITIL and SMEs 26

Success Factors When Implementing ITIL 37

Conclusion 46

IT Service Management 46

Benefits of ITIL 48

Success Factors when Implementing ITIL 48

ITIL and SMEs 51

Final Thoughts 54

References 55

Introduction to the Annotated Bibliography

Statement of the Problem

As time goes on, small- and medium-sized enterprises (SMEs) are subject to the same complex computing environments as their larger, enterprise-sized counterparts (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). For the purposes of this study, *small and medium-sized enterprises* are defined using the World Trade Organization's (n.d.) definition of a business consisting of 10-250 employees. Challenges that SMEs face include smaller workforces, lower budgets, and less complex computer environments (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016).

While SMEs are subject to these challenges, they do not traditionally have the same resources to implement the state-of-the-art, enterprise-level solutions that their larger counterparts employ to respond to and mitigate information technology (IT) challenges (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). However, this situation is beginning to change; IT management solutions that were once reserved only for large, enterprise-level systems are now coming into reach for SMEs (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016).

One potential solution for organizations with limited IT resources is the Information Technology Infrastructure Library (ITIL) (Axelos, n.d.). *The Information Technology Infrastructure Library (ITIL)* is a framework of management for businesses' information technology service management and operations; specifically, ITIL is a framework defined as a set of processes, procedures, tasks, and checks to allow organizations and individuals to gain the most value from IT services (Axelos, n.d.). For the purposes of this study, *information technology service management* is defined as "business-oriented service support, in which IT services are planned and managed according to their contributions to required business processes" (McNaughton, Ray, & Lewis, 2010, p. 219), while staff who perform *information*

technology operations are concerned with ensuring that software that has been built and deployed meets the service levels defined for the software (Iden & Bygastad, 2018).

The Information Technology Infrastructure Library emphasizes allowing companies to do more with less by focusing on business goals and carefully managing IT resources to achieve those goals (Steinberg, 2013). The Information Technology Infrastructure Library has been proven repeatedly to meet the IT objectives of organizations more cost effectively in multiple studies spanning decades (Steinberg, 2013). The flexibility of ITIL allows businesses to adapt the framework to match their specific needs and provides the added benefit of keeping costs down, as all resources are directly devoted to achieving business objectives (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016).

The Information Technology Infrastructure Library was once reserved almost exclusively for larger enterprises due to the high cost of buy-in for both education and tools (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). However, as ITIL becomes more established, the cost of implementing an ITIL solution becomes less and less (Steinberg, 2013). For this reason, ITIL is one potential solution to address IT resource waste, a lack of vision for IT objectives (Steinberg, 2013), and proper budgeting and planning for IT departments in organizations with limited resources, such as small and medium-sized enterprises (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). According to Melendez, Davila, and Pessoa (2016), the ITIL framework will allow SMEs to utilize their smaller infrastructures, budgets, and personnel to greater effect. The continuing decrease in the cost of implementing an ITIL solution (Steinberg, 2013) offers hope for resource-constrained SMEs (Melendez et al., 2016).

One challenge for SMEs who are considering the implementation of ITIL is that a key component of ITIL is the existence of a formalized IT management system within the organization (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016), and SMEs often lack formal IT

management processes (Melendez et al., 2016). Without a formal IT management system in place, the implementation of ITIL will be unsuccessful; thus, SMEs pondering the implementation of ITIL face a disadvantage due to their more informal IT management structures (Melendez et al., 2016).

Purpose Statement

The purpose of this qualitative study is to present literature to enable the identification and description of the value the ITIL framework can provide to SMEs and best practices in implementing ITIL for SMEs. The design of the study is a literature review. The method of inquiry is the collection, review, annotation, and analysis of selected research articles. The study will begin to inform the identification and estimation of the potential value that SMEs who embark upon the implementation and use of the ITIL framework can realize and the best practices that will help ensure their ITIL implementations are successful.

Research Questions

Main question. What value can SMEs gain by adopting the ITIL framework?

Sub-questions:

What benefits does ITIL offer SME IT leaders, IT resources, and IT departments?

What are best practices in implementing ITIL for SMEs?

Intended Audience

The intended audience for this study is three separate groups. The first group includes managers, IT leaders, and owners of SMEs. This group will be interested in the presentation of how to increase system stability and available features within their IT environments with the same levels of investment.

The second group in the target audience is independent IT contracting firms. Since SMEs can struggle with IT management due to insufficient financial resources and talent (Cruz-

Hinojosa & Gutierrez-de-Mesa, 2016), external IT firms who offer a one-stop shop for all of a company's IT needs can be an appealing option. If SMEs begin to actively pursue the implementation of ITIL, these IT contractors will be interested in best practices in implementing ITIL for the potential to not only better utilize their employees' time and system resources internally, but also to also provide faster and more reliable service to their customers.

The final group in the target audience is the IT personnel who will be tasked with implementing and using ITIL. These audience members will benefit from understanding the value of ITIL for the organization to provide a context for the efforts placed upon them in implementing and adhering to the standards.

Search Report

Search strategy. I started my search strategy by researching ITIL and its purpose. A colleague recommended Randy Steinberg's (2013) book *Measuring ITSM* as a jumping off point. From Steinberg's (2013) book, I was able to compile a list of key terms and phrases to use in my beginning searches in the University of Oregon Libraries' databases. While searching for ITIL terms exclusively provided numerous results, adding in vocabulary specific to SMEs trimmed the number of relevant articles dramatically. Filtering results to only those from peer reviewed journals and those available in full text reduced the limited number of results even further.

Despite these challenges, there were enough sources to begin to piece together a research project. These few sources' reference pages gave me further key words, journals, authors, and articles on which to focus. While some articles did not pertain exactly to ITIL and SMEs, many provided useful information on the benefits of ITIL, an overview of difficulties faced by companies utilizing the ITIL processes, and background information on the difficulties faced by SMEs in an ever-evolving business technology world. With the exception of the ITIL

implementation articles, I imposed a strict limit to correspond to the timeframe that encompasses the last two versions of ITIL, roughly the last 10 years.

Key terms. I performed an initial search of the literature in three areas:

- Benefits of ITIL,
- ITIL implementation and monitoring, and
- Difficulties faced by SMEs in implementing and using ITIL.

I used the following key words:

- Information Technology Infrastructure Library,
- ITIL,
- Information Technology Infrastructure Library AND Small Medium Enterprises,
- Information Technology Infrastructure Library AND Small Medium Business,
- ITIL AND SME,
- ITIL AND SMB, and
- ITIL implementation.

Search engines and databases. The primary method I used to search for articles was to access the University of Oregon Libraries' databases. These 493 databases provide students with access to a variety of content that would not otherwise be available without costly subscriptions from various academic journals through the use of the school login credentials. While I also utilized Google Scholar to some extent, most of the results I found with the Google Scholar search engine were duplicate results from the UO Libraries' search function or were locked behind a pay wall. Some of the most useful databases for my study that I searched via the University Libraries' search tool include:

- Academic Search Premier,
- Business Source Complete,

- Computer Source,
- IBISWorld,
- Journal Storage (JSTOR), and
- Statista.

Documentation approach. I documented sources in a blend of Microsoft Word and Excel documents. I monitored full abstracts and citations via a searchable Word document while I took a broad strokes approach to sorting the sources in the Excel documents. The Excel documents contain fields for the name of the article, a brief overview of information that could be of use to the study, the author, key words, and the website in which it was found. The goal of the Excel document was to serve as a quick reference guide, while the Word document provided all the necessary information for citing the information in the research paper.

Reference Evaluation Criteria

I evaluated references using the five characteristics described in the *Evaluating Information Sources* guide by University of Florida's Center for Public Issues Education (CPIE) (2014). I used the criteria to limit the literature in this study in the following ways:

- Authority: I limited my research to peer-reviewed articles found in scholarly journals, books from authors regarded as experts in their fields, or publications from organizations who publish the guidelines for ITIL. I considered self-published books only if the author was an established expert in the field. I gave precedence to reference sources that appeared regularly in peer-reviewed journals.
- Timeliness: I limited my research to focus on the two most recent versions of ITIL – Version 3 and Version 4. These last two version encompass the last ten years of the ITIL framework, but because Version 4 has only recently been released, very little literature exists for this topic yet. Because the study does not specifically focus on

project management and the implementation of ITIL, I gave some leniency to sources of these subjects that were published longer than ten years ago.

- Quality: I selected works that do not contain any errors in grammar, spelling, and punctuation. I made exceptions for sources that were peer reviewed where English was not the first language of the author(s).
- Relevancy: I selected works that related to one or more of my topics of study; specifically, the benefits of ITIL, difficulties faced in SMEs' IT departments, and ITIL's success/failures in SMEs.
- [Lack of] Bias: I have selected sources from peer-reviewed, scholarly journals; ITIL governing sources; and books published by established authorities. Where possible, I have avoided sources from vendors or those seeking to sell products and/or services; the one exception is reference sources from Axelos, the organization that provides the ITIL certifications. While Axelos poses some bias concerns, potential bias is overweighed by the fact that they are the source of the most well established, respected certifications related to ITIL.

Annotated Bibliography

Introduction

The following Annotated Bibliography presents 15 references that examine IT Service Management and IT Infrastructure Library as they relate to SMEs. These references have been selected to help IT leaders and owners of SMEs, IT contracting firms, and IT personnel who will be tasked with the implementation of ITIL address the key factors to be considered for an ITIL implementation in an SME. References are presented in four categories that describe primary considerations when exploring an ITIL migration: (a) IT Service Management, (b) Benefits of ITIL, (c) ITIL and SMEs, and (d) Success Factors When Implementing ITIL.

Each annotation consists of three elements: (a) the full bibliographic citation, (b) an abstract, and (c) a summary. The abstracts included are complete as published. The summaries present a discussion of how SMEs can leverage the benefits of ITIL processes, best practices in implementation and risk mitigation to assist SMEs in receiving all the benefits of ITIL, and information for third party contractors to enable the offering of manageable ITIL plans for their SME clients.

IT Service Management

Iden, J., Bygstad, B. (2018). The social interaction of developers and IT operations staff in software development projects. *International Journal of Project Management, 36*(3), 485-497. doi:10.1016/j.ijproman.2017.12.001

Abstract: This paper investigates how developers and IT operations staff interact in software development projects. We analyze data from 42 IT professionals from 18 Norwegian firms through the lens of social interaction and project management theory. Our analysis suggests that their social interactions are hampered by a variety of factors. The study contributes to the research by providing an analysis of the elements of social interaction and how they

contribute to better outcomes. For practice, we offer an assessment instrument for improving the social interaction in software development projects.

Summary: Iden and Bygstad cover the subject of how IT operations personnel should be considered and heavily involved in the software development process. There are at least four main concerns when developing a new solution related to facilitating work between IT operations and the development team:

- Culture – Culture differences reside between the two siloed groups of IT development and IT operations. In addition to this, physical barriers such as department, company, or even location add to the lack of communication and challenge in knowledge sharing between the two teams.
- Transition into Production – Since IT operations will be responsible for managing the software after its development, a strong handover procedure is necessary to overcome potential implementation difficulties.
- Current Infrastructure Constraints – These pieces of software are complex systems sharing numerous hardware, networks, operating systems, and databases with other software. The requirements of these shared systems need to be communicated by the operations staff to the development team to reduce the chances of misaligned requirements.
- Future Infrastructure Requirements – New solutions can bring around change to non-functional requirements. These non-functional requirements include server/network configuration, software, hardware and network capabilities, security, procedures, documentation, service catalogues, service level agreements, and vendors.

The authors suggest that organizations can obtain a better understanding and identification of non-functional requirements by including individuals from the operations team

in scoping and developing new software solutions. The authors sought to accomplish better cooperation and coordination between the IT development team and the IT operations team through partnership, where the two groups recognize each other as partners in the project, with mutual goals and trust in each other; shared knowledge, where each group is well informed of the knowledge areas of the other group to facilitate participation in each other's key activities, which leads to respect for the professional contributions and challenges of the other; effective communication, or the effective creation and sharing of information by both groups during the project; and integrated planning efforts, where each group participates in the planning efforts of the other and the two groups' planning efforts are integrated.

The authors conducted an expert group study by assembling a group of 42 software developers, IT operations staff, and systems owners and asking them to identify six specific problems they had encountered or were currently experiencing in the interactions of developers and IT operations staff in their own development projects. Their findings included 268 issues and explanations from the group. The authors identified the following unanimous observations from the practitioners in the study: (a) a great need for more committed cooperation, which the authors define as consisting of partnership and shared knowledge, and (b) a great need for formal coordination, which the authors define as consisting of communication and integrated planning.

Key takeaways for service management include the need for training of IT operations staff and improved service desk documentation to enable the IT operations staff to effectively address issues, user requests, and problems that arise after the development is completed and the software is deployed. The authors also note that knowledge sharing between the developers and IT operations team is crucial to enable effective problem management and therefore meet SLA targets. Finally, the study revealed issues that arise by involving IT operations too late in the

project, forcing unnecessary hardware and software purchases and costly and complex operational environments, issues that impact service management.

Liu, M., Goa, Z., Luo, W., Wan, J. (2011). Case study on IT service management process evaluation framework based on ITIL. In *2011 International Conference on Business Management and Electronic Information (BMEI)* (pp. 199-202). Piscataway, NJ: IEEE. doi 10.1109/ICBMEI.2011.5917881

Abstract: This paper study [*sic*] the IT service management framework and associated processes' definition, operation and the management methods of DC Company based on Information Technology Infrastructure Library (ITIL). Key performance indicators (KPI) and the service level agreement are applied to DC Company, both KPI evaluation framework and its weights are determined. Finally, IT management process evaluation framework is analyzed.

Summary: The authors focused on developing and scoring popular ITIL key performance indicators in DC Company, a large IT service provider in China. The authors first identify nine processes associated with IT performance for the company: (a) quality management, (b) customer satisfaction management, (c) cost budgeting management, (d) service level management, (e) configuration management, (f) change management, (g) problem management, (h) incident management, and (i) service desk. The authors then identified nineteen goals associated with the processes; for example, the quality management process was assigned goals of responding to the request in a timely manner and delivering service normally. Finally, the authors assigned key performance indicators to the goals; for example, the goal of responding to the request in a timely manner was assigned the KPIs of time of response to the request and the time needed to deal with every request.

The authors then analyzed the 34 IT processes from the Control Objectives for Information and Related Technology (COBIT) framework created by the Information Systems

Audit and Control Association (ISACA) to identify nine critical success factors of IT Service Management for the DC Company: (a) methodology, (b) process monitoring, (c) IT investment management, (d) IT solutions, (e) IT strategic planning, (f) data management, (g) system management, (h) project management, and (i) process monitoring. The authors provided questionnaires to undisclosed IT experts to identify the most critical success factors for service management at DC Company; of the list of nine critical success factors, the authors identified (system development) methodology, process monitoring, and (IT) investment management, respectively, as the most important of the success factors because they were assigned the lowest scores by the experts.

The quality of the article is problematic, with numerous grammatical issues that can be attributed to authors who did not learn English as a first language and an error in the table listing the results of the IT Service Management Process Evaluation at DC Company: the IT quality management process was left out of the table, while process monitoring was listed twice. Nevertheless, this article provides value to the research paper by providing the audience with an approach to identify critical success factors of IT Service Management based on the COBIT framework prior to and after implementing IT Service Management.

McNaughton, B., Ray, P., Lewis, L. (2010). Designing an evaluation framework for IT service management. *Information & Management,* 28(1), 219-225. doi 10.1016/j.im.2010.02.003

Abstract: Applying IT Service Management (ITSM) is a key issue in the management of an organization's IT function. The IT Infrastructure Library (ITIL) is the most popular and influential framework for applying ITSM. With adoption growing globally it is important to understand the benefits that ITIL processes can bring to an organization. To date the benefits of implementing and using ITIL processes have been predicted or assumed with very little research

and minimal anecdotal evidence. We present a design of a holistic evaluation framework for ITSM improvement efforts with particular focus on ITIL.

Summary: McNaughton, Ray, and Lewis assert that most of the stated benefits for ITIL come from studies that are not founded on the basis of practical research. The authors instead have developed a methodology to provide researchers with tangible analysis and results in both objective and subjective areas to determine which ITIL best practices are successful and support business processes. To develop this model the researchers took the common elements from nine separate ITSM models and expanded some of the services in those models to better align with the ITIL framework. The authors' framework focused on both the process and corporate levels for four perspectives: (a) IT users, (b) IT employees, (c) management, and (d) technology, or the perspective of IT/IS management and the IT department as a whole. The authors were interested in determining the overall benefits from the ITIL improvement for factors such as service quality, the culture of service provisioning, user satisfaction, and operations.

The authors measured each of these areas via both a survey and scoring metrics to determine the efficiency, effectiveness, and capability of the metrics of study. This research is valuable as it gives the audience of this research paper the ability to measure the benefits that have resulted from an organization's implementation of ITSM.

Nabiollahi, A., Alias, R., Sahibuddin, S. (2011). A review on multiple perspectives of IT services in information systems and computer science. In *2011 International Conference on research and Innovation in Information Systems (ICRIIS)* Kuala Lumpur, Malasia: doi 10.1109/ICRIIS.2011.6125704.

Abstract: Services innovations are intensively associated with ICT innovations and adoption and diffusion of ICT. Recently, various issues and views of services have been addressed through new disciplines of services. This paper attempts to review multiple disciplines

of IT services in Information Systems and Computer Science briefly. While in SSME and ITSM, the focus is mostly on planning and management of IT services, in Services Computing discipline and in service oriented domains of services such as SOA and SOI, the emphasis is on service design and operation. As we discussed in this paper, there is a call to conducting research in service-oriented technology and management for the coming decade. Also there is a rich context for researchers on services design, services development, services marketing, services delivery, services management, and services operation from behavioral, economics, technical, and organizational perspectives in computer science, information systems, e-commerce and management disciplines. For achieving any research in this area, quantitative, qualitative and experiment methods, case and field studies, and design science approaches were encouraged to be considered.

Summary: The authors identify and define four different ITSM frameworks and three different service-oriented disciplines. The four ITSM frameworks are:

- ITIL – provides guidance in defining a framework and guiding organizations to implement best practices in service management.
- ISO/IEC 20000 – focuses on guiding companies through best practices for implementing service delivery and service support processes exclusively.
- Microsoft Operations Framework (MOF) – seeks to guide companies through best practices and activities as they relate to the IT lifecycle: conception, development, operation, maintenance, and retirement.
- CMMI for Services – a collection of best practices put forth from government and industry that serves as a maturity model in service provider organizations (para. 6 – 9).

Service oriented disciplines focus on designing a service to be used across multiple different contexts such as business processes, IT processes, and systems. The authors provide an overview of three service-oriented disciplines:

- Service Oriented Architecture (SOA Reference Model) – a paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains.
- SOA Integration Model – SOA Alliance of The Open Group has defined three domains for Service Orientation within Information technology: the Business Architecture, the Data and Information Architecture and the Infrastructure Architecture.
- Service Oriented EA – The core of EA defines the architectural models of an enterprise to meet requirements of future changes in an efficient and planned manner; SOA represents the latest potential to complement and improve EA. (para. 12 – 17).

One useful takeaway from this article is the clear definition that is provided for ITSM: "a set of processes that detail best practices based on ITIL standards to enable and optimize IT services in order to satisfy business requirements and manage IT activities" (para. 6). The authors also provide an overview of ITIL: "a library whose aim is to define a framework and a source of good practice in IT service management and service management" (para. 8). Additionally, the authors note that there are two separate approaching for achieving better IT service. Specifically, while the ITSM framework seeks to solve problems through the management of services, Service Oriented Architecture (SOA) focuses on proper service design instead. Given that budgetary constraints can hit SMEs, the implementations of some SOA processes could be beneficial for SMEs to explore.

Benefits of ITIL

AXELOS. What is ITIL? (n.d.). Retrieved from https://www.axelos.com/best-practice-solutions/itil/what-is-itil

Description (from the webpage): ITIL is used by millions of professionals globally. Businesses are built on ITIL.

ITIL supports organizations and individuals to gain optimal value from IT and digital services. It helps define the direction of the service provider with a clear capability model and aligns them to the business strategy and customer needs.

ITIL, a professionally recognized certification scheme, provides comprehensive, practical and proven guidance for establishing a service management system, providing a common glossary of terms for businesses using IT enabled services.

ITIL is a widely accepted approach to IT service management (ITSM), which has been adopted by individuals and organizations across the world. It provides a cohesive set of best practice, drawn from the public and private sectors internationally.

Every year, organizations invest heavily in adopting and adapting ITIL into their business practices and upskilling their workforce with ITIL qualifications.

Summary: This webpage provides a description of ITIL from AXELOS, an organization that is "responsible for developing, enhancing and promoting a number of best practice frameworks and methodologies used globally by professionals working primarily in IT service management, project, programme, and portfolio management and cyber resilience ("About AXELOS," n.d., para. 1); ITIL is one of the methodologies. While there is limited information on best practices on the webpage, there is mention that "Extensive research by AXELOS, involving a diverse group of stakeholders (+2,000), has consistently shown that ITIL is fundamental to businesses, enables transformation and helps organizations realize value" ("What

is ITIL," n.d., para. 6). The webpage further defines ITIL as a methodology that advocates that IT services are aligned to the needs of the organization and support its core processes. The webpage asserts that the ITIL approach provides guidance at the organizational and individual level on methods to use IT to facilitate business change, transformation, and growth. The webpage also ties ITIL to ISO 20000:

> ITIL is mapped in ISO 20000 Part 11. This recognizes the way that ITIL can be used to meet the requirements set out for ISO 20000 certification and the interdependent nature with ITIL. This is the first such mapping that ISO (the International Organization for Standardization) has allowed to be part of their standards. The ITIL ITSM Best Practice is supported by a certification scheme that enables practitioners to demonstrate their abilities in adopting and adapting the framework to address their specific needs (para. 10).

This source is relevant to my study because it provides a description of potential benefits an organization can gain through the implementation of ITIL directly from AXELOS, the organization responsible for developing, enhancing, and promoting ITIL best practices.

Steinberg, R. A. (2013). *Measuring ITSM: Measuring, Reporting, and Modeling the IT Service Management Metrics That Matter Most to IT Senior Executives.* Bloomington, Indiana: Trafford Publishing.

> **Abstract:** IT faces a serious challenge. . .
>
> - It is the only business organization that almost never measures its operational effectiveness and efficiency
> - It seldom measures the costs incurred for the services it delivers outside the budget it is given

- It monitors technologies but almost never monitors labor in terms of rework, waste, and misuse
- It implements technologies with little measurement of deficiencies and defect rates

In short, IT rarely monitors and manages to the metrics that matter most to IT Senior Executives. Worse yet, the following basic concepts seem to bypass many IT management organizations concerning the services they support and deliver:

- If you don't measure it, you can't manage it
- If you don't measure it, you can't improve it
- If you don't measure it, you probably don't care
- If you can't influence it, then don't measure it

IT can no longer operate this way. It's time to operate IT like a Service Organization.

Summary: Steinberg's book serves to assist the technology professional who has moderate experience in IT and a familiarity with ITSM concepts to transition into setting up an ITSM Metrics Program to identify performance metrics. Utilizing experience and research, Steinberg guides the reader through identification of operational metrics, key performance indicators (KPIs), tolerances, critical success factors (CSFs), and other metrics for the ITSM processes: (a) incident management, (b) problem management, (c) request fulfillment, (d) event management, (e) access management, (f) service desk, (g) change management, (h) release management, (i) configuration management, (j) service level management, (k) availability management, (l) capacity management, (m) IT service continuity management, (n) IT financial management, and (o) IT workforce management.

The author describes operational metrics as observations of operational events for each of the ITSM process areas, and provides examples of total number of changes implemented, number of calls handled, and total expended IT costs. The author describes KPIs as indicators of

the performance level of an operation or process and provides examples of change efficiency rate, change labor workforce utilization, incident repeat rate, capacity management process maturity, and total service penalties paid. Steinberg defines tolerance thresholds as representing upper and lower bounds for acceptable and unacceptable KPI values and notes that they should be set by the IT Service Manager and agreed to by IT and business senior management. The author defines CSFs as metrics for key operational performance requirements that indicate whether a process or operation is performing successfully, from the standpoint of a customer or the business. Steinberg notes that CSFs are typically assigned a performance of *low*, *medium*, or *high* and provides as examples Protect Services When Making Changes, Provide Services at Acceptable Costs, and Continually Improve Availability of Services.

The author asserts that there are benefits to building and implementing an ITSM metrics program:

- Enabling senior executives and management to make accurate and timely business decisions by providing indicators,
- Providing visibility into IT support and delivery services to gauge their effectiveness and efficiency,
- Providing a foundation to identify and prioritize IT service improvement enhancements,
- Enabling the surfacing of service deficiencies and problems through analytical information before they result in serious negative impacts,
- Providing a process-based root cause analysis to surface deficiencies in service operations, thus avoiding the assignment of blame to individuals,
- Providing senior management with confidence that IT is providing effective self-management, and

- Ultimately to prevent operational risk.

The author lists a number of risks that can be avoided through the provision of effective service management, including service outages, rework, slow operational processes, dissatisfied customers, low employee morale, loss of revenue and sales, and unexpected costs.

This book is useful for this study because it provides detailed information on how to use metrics to continually assess the performance of an organization's ITSM program and make adjustments to address issues. The author also describes the risks that can be provided through effective service management. One of the most important points Steinberg makes related to this research paper is the ability to scale down larger concepts into a more affordable and manageable model for SMEs and how to implement dashboards to display metric information through the use of low-cost or free dashboards and/or reporting tools.

ITIL and SMEs

Cruz-Hinojosa, N., & Gutierrez-de-Mesa, J. (2016). Literature review of the situation research faces in the application of ITIL in small and medium enterprises. *Computer Standards and Interfaces, 48*, 124-138. doi 10.1016/j.sci.2016.05.001

Abstract: This paper carries out a review of the issues that Small and Medium Enterprises (SMEs) face when trying to ensure their alignment with Information Technology Infrastructure Library (ITIL) guidelines. It is well-known that SMEs experience different challenges to those experienced by Large Enterprises, however their demands are the same as larger companies. Given that they have less labor and technological resources, they must optimize their service levels and adapt the activities of their IT departments to the needs of the company without negatively impacting service commitments. In this context our main objective is to establish a complete review concerning the important information that exists in relation to ITIL and its use in Small and Medium Enterprises, evaluating methods for the collection of

evidence and analysis. For this reason we have conducted a systematic literature review with the automated search in the range 2007–2015 which has led us to identify thirty-nine articles of relevance. It is noted that, although it was initially expected that there might be enough information that would help us validate and interpret the way that ITIL functions for Small and Medium Enterprises, the reality is that there are not many publications of relevance that deal with the topic of ITIL and SMEs.

Summary: The authors performed a literature review of ITIL implementations within SMEs. First round searches yielded 67 results. After applying their inclusion/exclusion filters based on relevancy, authority, and age, the authors identified a total of 16 articles, 21 conference proceedings, and two book chapters. The authors then ranked each article on its context, study design, and validity to produce the study's overall Rigor score; the maximum score is three.

Through their review the authors noticed many commonalities in the findings from the studies, including:

- Inadequate research service;
- Lack of communication between employees of contact and management, with employees unclear on their roles;
- The need to improve customer perception;
- ITIL is a help for the management of services but provides little in the way of implementation or execution of the processes;
- ITIL provides little guidance on the processes that services and support services produce;
- ITIL has no single approach to improving processes of services;
- Lack of descriptive literature on the concepts of management of services and ITIL frameworks cause complications and confusion;

- ITIL is not very well established in SMEs; and
- ITIL in complement with other methodologies can help find inefficiencies in the organization and make quick and easy improvements.

While there are many articles covering the benefits of ITIL within larger organizations, the authors outline the differences in ITIL adoption for smaller enterprises, namely that the complexity, cost, and risk to implement such a large IT change can carry a heavy burden for an SME. Additionally, the authors point to other references that assert that the size of an organization needs to be large as a prerequisite for even considering ITIL adoption, thus, removing ITIL from the potential toolbox of any SME. In their conclusion, the authors ultimately determine that the lack of guidance, experience, and knowledge of SMEs' IT departments can be the key factors in a failed ITIL implementation.

Lema, L., Calvo-Manzano, J., Colomo-Palacios, R., Arcilla, M. (2015). ITIL in small to medium-sized enterprises software companies: Towards an implementation sequence. *Journal of Software: Evolution and Process, 27*(8), 528-538. doi 10.1002/smr.1727

Abstract: Information technology infrastructure library (ITIL) framework is a set of comprehensive publications providing descriptive guidance on the management of IT processes, functions, roles, and responsibilities related to IT service management. However, and in spite of its repercussion and popularity, the ITIL framework does not suggest an implementation order for their processes. This decision constitutes the first challenge that an organization must overcome when starting an ITIL implementation, the enterprise size being one of the leading factors to be considered in the decision-making process. In the scenario of small and medium enterprises dedicated to producing software, this paper is devoted to investigating which processes are the most selected to start the implementation of ITIL in these organizations. This is performed by means of two different instruments, first, a systematic literature review on the topic

and second, a survey conducted among experts and practitioners. Results show in both cases that incident management process should be the first process when implementing ITIL framework.

Summary: The authors conducted a systematic literature review on implementation order for ITIL and conducted studies to identify best practices and the best process sequencing. The authors first identified a total of 1,276 sources in the literature review. Of these 1,276 sources, they deemed 77 to be relevant and deemed nine of the 77 to be primary sources. They focused the research on these nine primary sources.

The authors explain that adoption of ITSM practices, and ITIL specifically, is difficult for SMEs due to limited budgets, personnel, and simple management structures. These items combine to cause the implementation and upkeep of the ITIL system to cost more than is returned on the investment. Other complications for ITSM implementation for SMEs revolve around the relatively simple internal structures of SMEs, resulting in difficulties coping with the number of roles required by ITSM; the number of services; lack of official documentation and instruction; and the internal documentation requirements of ITSM.

The authors state that incident management is the single most adopted process of ITIL by organizations of all sizes, at 95 percent adoption by companies that are employing some form of ITIL. Incident management is followed in popularity of implementation by service level management, service catalogue management, and service asset and configuration management processes. The authors attribute the popularity of these processes to the fact that they provide the largest return on investment and most notable improvements to IT processes through the incident management pillar of ITIL. The authors also state that incident management has the highest return on customer satisfaction and visibility throughout the organization as its core structure revolves around increasing customer service.

Lema-Moreta, L., Calvo-Manzano, J. (2017). A proposal for implementation of ITIL incident management process in SMEs. *IEEE Second Ecuador Technical Chapters Meeting (ETCM).* doi 10.1109/ETCM.2017.8247494

Abstract: According to previous findings, in a situation where an ITIL implementation is performed, the Incident Management Process could be the first process to be implemented; however, the ten activities defined in the process are too extensive to be implemented in a SME. For this reason, it is relevant to develop a strategy for implementing all ITIL processes in order to encourage the SMEs starting a formal ITIL implementation. In this article, an implementation strategy using a profile scheme has been developed, this is done by means of two different instruments. Firstly, a deep analysis of selected process and secondly an ISO 29110 structural analysis are revised too. After this, the proposal strategy was applied to Incident Management Process. For this purpose a Delphi study with some experts in the area was conducted in order to validate some constrains related to Incident management activities. As a result, a proposal of A Strategy for implementing ITIL Incident Management Process is presented.

Summary: The authors of this study wanted to determine an effective way to implement ITIL in stages in an SME. By consulting both the official ITIL v3 publication and the ISO 29110 standard, a common standard for very small enterprises, the authors were able to design a starting point for ITIL implementation specific to SMEs.

Their past research had shown that Incident Management was the main ITIL foundational skill SMEs wanted and was most often implemented first. Despite the fact that incident management has been adopted by 95 percent of businesses using ITIL, the authors found little guidance on how an SME should direct their next efforts.

The authors provide background information on Incident Management and key definitions. Incident Management seeks to ensure efficient service operation; maintain service

operation stability; and provide service value to the customers, users, and service provider. The authors quote ITIL terms in defining an incident as “an unplanned interruption (event) to an IT service or reduction in the quality of an IT service or a failure of a configuration item that has not yet impacted an IT service" (para. 5). Because of the relationship of incident events and users, incident management is often used as the pilot program for an ITIL implementation due to its high visibility. This visibility allows further justification for additional expenditures in the ITIL pipeline due to the high value that it provides in meeting the needs of the employees and customers.

The authors identify nine incident management activities for small to-medium sized enterprises:

- Incident Identification,
- Incident Logging,
- Categorizing the Incident,
- Assigning Priority,
- Initial Diagnosis Activity,
- Incident Escalation,
- Investigation and Diagnosis,
- Resolution and Recovery, and
- Incident Closure.

Despite official ITIL documentation providing the different operational activities in incident management implementation in order, the authors instead used a Delphi study consisting of five respondents who were certified in ITIL practices and experienced ITIL implementation experts to sort the incident management activities into two categories: quick wins and easy to implement. The authors also received feedback from the respondents on the dependency of each

activity to the other activities. Additionally, the activities were categorized into basic, intermediate, and advanced.

The authors identified four basic activities: incident identification, incident logging, resolution and recovery, and incident closure. All of these activities except for incident identification were assessed as easy to implement; the four activities in the incident management process were prioritized as the first to implement for an SME transitioning to ITIL.

Machado, R.F., Reinehr, S., & Malucelli, A. (2012). Towards a maturity model for IT service management applied to small and medium enterprises. In D. Winkler, R. V O'Connor, & R. Messnarz (Eds.), *Communications in Computer and Information Science, 301,* (pp. 157-168). Switzerland: Springer Nature Switzerland AG. Retrieved from https://link.springer.com/chapter/10.1007/978-3-642-31199-4_14

Abstract: Despite the discussions about Information Technology (IT) management, models are constantly on the agenda. A lack of maturity models that meet the needs of IT management service providers which conform to the reality of small and medium-sized companies can be observed. This paper presents a proposal for a maturity model for IT service management, called MM-GSTI. The proposed model is compliant to ISO / IEC 20000 and models CMMI for services (CMMI-SVC) and MPS.BR, and uses practices described in ITIL. Its goal is to help service providers in the implementation of improvements for the management of IT services.

Summary: The authors consulted IT directors from 167 U.S. organizations on the prevalence of ITSM in U.S. organizations and found that 90 percent of these organizations have developed at least some of the ITSM processes. The authors also explain that there are varying degrees of ITIL maturity. The authors sought to develop an ITSM maturity model that can be applied to SMEs, noting that this type of model has yet to be developed and is needed due to the

number of SMEs in the marketplace, the need for SMEs to be able to gradually adopt ITSM processes, and the challenge SMEs face in adopting a large number of practices at the same time. This led the authors to develop the Maturity Model for IT Services Management (MM-GSTI). The model includes eight sets of processes and practices and includes the performance of assessments after each stage to identify the results of the process improvements.

The authors assembled a field research team to implement MM-GSTI in a variety of SMEs. These teams focused on two different approaches: implementation based on the maturity model that was developed by the authors, and implementation of policies in the suggested sequence of the ISO/IEC/20000-1 standards. The authors also conducted research from other authors on the optimal implementation sequence for ITSM.

It is important to note that all six of the SMEs involved in this study were Brazilian software or IT service companies consisting of under 250 employees that had already implemented some form of ITSM. The survey the authors sent to these SMEs sought to answer two questions: (a) What process was used when first implementing ISTM and what would the company change if they had to do it again? (b) What is the company's suggested sequence of implementing ISO/IEC/2000-1?

The results of the questionnaires indicated the top ITSM activities to implement first are identified as follows: (a) incident management, (b) service level agreement management, (c), problem management and (d) change management. The MM-GSTI model combines core ITSM practices with the ITIL concept of maturity levels.

This study is helpful to this research paper by providing a suggested guide on how SMEs can increase their odds of success when implementing their own ITSM/ITIL framework. While service level agreement management may not apply directly to all forms of business as a primary

activity, the other results fall in line with what has been noted by experts to provide the most value and visibility to the new system.

Marrone, M., Gacenga, F. Cater-Steel, A., & Kolbe, L. (2014). IT Service management: A cross-national study of ITIL adoption. *Communications of the Association for Information Systems, 34,* 865-892. doi 10.11705/1CAIS.03449

Abstract: IT Service Management (ITSM) is transforming the management of the IT function on a global scale with major changes in work practices. The intent of this study is to empirically explore how IT service management is adopted in today's global economy. The article examines the adoption of ITSM processes as defined in the IT Infrastructure Library (ITIL®). The adoption of operational processes is compared to that of tactical/strategic level processes and the contribution of country, size, and industry sector to variation in adoption of ITIL processes is assessed. Institutional theory is used as a foundation for the study. The analysis is based on 623 responses to three surveys conducted in the UK, USA, DACH (German-speaking countries) and Australia.

Summary: Marrone, Gacenga, Cater-Steel, and Kolbe note that some of the core reasons behind adopting an ITIL model are legal compliance, risk management, cost savings, or to satisfy customers more effectively. The authors explain how processes such at ITIL can become institutionalized and be universally praised despite offering little to no benefit. Once this happens, the apparent success from other companies utilizing the institutionalized model can cause other organizations to imitate the adopter, thus furthering the misinformation about the model.

The authors conducted three surveys and received and analyzed 623 responses in the UK, USA, DACH (German-speaking countries) and Australia. These surveys focused on ITIL's adoption, benefits, and performance measurements in companies with varying countries, sizes,

and industries. The authors specifically note that some companies tend to perform a limited deployment of the ITIL framework – specifically stating that managers will pick and choose specific processes rather than fully investing in ITIL. Reasons for pursuing limited deployments include the fact that some core concepts are complex and require substantial training, while others carry a heavy burden of expensive tools and technology.

Significant to this study, the authors assert that small organizations should not be considered to be "scaled-down versions of large firms" (p. 49). The authors state that process improvement models, including ITIL, may not be appropriate for small businesses. The authors identify anecdotal evidence of specific issues with ITIL deployments within SMEs, including documentation overload, flat management structures that find difficulty in supporting the ITIL processes, high resource requirements, high training costs, lack of needed guidance, and costly tools.

This study is important to this research paper because the authors focus specifically on how an organization's size impacts ITIL adoption.

Melendez, K., Davila, A., & Pessoa, M. (2016). Information technology service management models applied to medium and small organizations: A systematic literature review. *Computer Standards and Interfaces, 47,* 120-127. doi 10.1016/j.csi.2015.10.001

Abstract: The main responsibility of the Information Technology Service Management (ITSM) as an organization is to provide services in high level quality. That implies that the services will be an appropriate service and it will ensure continuity. In this context, the organization needs to adopt the best practices in service management to be more efficient and competitive. Some ITSM models collect the best practices of recognized organizations. These models are mainly applied by large organizations. (OBJECTIVE) The objective of this study is to gather experiences in the application of ITSM models in small organizations. (METHODS) To

achieve this objective a systematic literature review was performed. (RESULTS) We found primary studies applied to IT areas from some large and medium companies but there is a few in small companies' context. (CONCLUSION) During the SLR we have identified some improvements and difficulties in many organizations, we have founded when applying ITSM models. The principal difficulty was the lack of knowledge of its personnel and consultants have, for adopting a model. On the other hand, companies who succeeded in the application of an ITSM model, had founded some benefits, such as processes improvement, higher user satisfaction, and service cost and time reduction.

Summary: This systematic literature review focuses on the implementation of ITSM specifically within SMEs. The authors selected studies published in journals, conferences, meetings or workshops that answered the research questions: (a) What outcomes have been developed in the ITSM for medium and small organizations? (b) What ITSM proposals have been adopted in the organization? (c) What outcomes have been obtained in the adoption of the ITSM proposals in medium and small organizations?

Upon applying these requirements, the authors found 17 sources that were presented at scientific conferences or from indexed journals. The authors then organized the resulting 21 studies into different categorizes based upon their contents: research methods, proposals, framework, service processes, and size of organization. The authors found that most proposals or model-related studies were created to solve a problem of a specific organization and mostly related to the service and incident management processes. The authors note that the implementation of one or both of these two processes were overall successful in providing improvements to the organization in the following areas: service catalog management, customer service incidents, reduction in cost of time, communication with users, user satisfaction, and service availability.

The authors point out that it is important to understand the problem the organization is attempting to solve or have clear business goals prior to attempting an ITSM implementation. The authors suggest that the following items be fully investigated prior to planning an ITSM implementation:

- Needs, problems, and business goals – items such as a determination of needs and how to align the adoption with business objectives,
- Training – staff members who are well trained in ITIL leads to better adoption and implementation,
- Definitions – defining the service level catalog and service level agreements,
- Model – identifying which ITSM framework will best serve the business' structure and goals, and
- Other – Senior management buy-in and identification of key roles and responsibilities.

The authors then explain the difficulties associated with implementing the ITIL framework as:

- Difficulties in recruiting ITIL talent,
- Complex framework,
- Lack of awareness on the need to optimize IT processes,
- Lack of resources present in SMEs,
- Lack of knowledge of the model, and
- Lack of motivation.

The authors suggest that smaller organizations avoid more robust models such as ITIL and instead focus on combining frameworks with lower complexity based on their specific IT-related needs.

Success Factors When Implementing ITIL

Iden, J., & Langeland, L. (2010). Setting the stage for a successful ITIL adoption: A Delphi study of IT experts in the Norwegian armed forces. *Information Systems and Management, 27*(2), 103-112. doi 10.1080/10580531003708378

Abstract: There is a growing interest in businesses around the world when it comes to professionalize IT operation by implementing process-based frameworks built on best practices. There are, however, indications that firms in general find the concept of ITIL challenging, and that many firms are confused about how to implement ITIL successfully. This research has studied what are the most important factors for the successful adoption of ITIL, and bases its results and conclusions on a study in which a ranking-type approach to the Delphi method has been conducted in the Norwegian Armed Forces. A panel of experts on the adoption of ITIL has participated through the method three phases: brainstorming, reduction and ranking. The result is a ranked list of the most important factors, which clearly demonstrates that issues related to management, and leadership, competence and training, information and communication, stakeholders' involvement, and culture, are considered by the experts as most important. Factors related to technology and methodology was ranked lower. This paper validates the results of earlier studies, and provides additional knowledge about the factors that influence successful ITIL adoption.

Summary: The authors set out to develop a list of factors that are the most important and require additional attention during an ITIL implementation. The authors performed a Delphi study and sent out multiple rounds of surveys to an anonymous panel of experts. In this case, the panel of experts were all located within the Norwegian Armed Forces due to their early adoption of ITIL in 1998 and their transition between version 2 to version 3. Each member of the panel was required to have experience with ITIL as an IT manager and project manager, extensive

experience with ITIL as a project member, or extensive experience with ITIL as a member of IT staff. Fifteen members were identified as potential candidates for the study.

The authors broke the Delphi process into three phases:

Brainstorming: Participants were asked via a questionnaire which factors they believe to be the most important for ITIL adoption and why. From these results, 172 different items were listed, but the list was reduced to 62 factors through consolidation of the terms with similar meanings. These results were sent to the participants for confirmations and edits as required. Once approval of the list was given by the participants, the study moved to the next phase.

Reduction: Each participant was asked to identify their top 10 factors of the 62 provided. These results reduced the list from 62 to a more manageable 12 items for future ranking.

Ranking: The experts were asked to prioritize the 12 factors in order. Three separate rounds were taken in this step due to low levels of concordance in the first two rounds. Three members of the study dropped out by this point and the third round consisted of 12 members.

The results of the study show that management's buy-in and understanding of the ITIL framework is the most important factor for an ITIL implementation. "Managers at all levels must have ownership to the ITIL introduction" was ranked number one, "Senior management must formally decide the introduction of ITIL" ranked second, “Identify and involve key personnel, and let them participate in the design and improvement of processes” ranked third, and "Senior management must have knowledge about and understanding of what process orientation means" was ranked fourth.

This study is relevant to the research paper as it identifies key success factors for the implementation of ITIL. It also identifies potential pain points and allows for the target audience of this paper to plan accordingly to avoid them.

Pollard, C., & Cater-Steel, A. (2009). Justifications, strategies, and critical success factors in successful ITIL implementations in U.S. and Australian companies: An exploratory study. *Information Systems Management*, *26*(2), 164-175. doi 10.1080/10580530902797540

Abstract: A growing number of organizations are implementing the ITIL (IT Infrastructure Library) “best practice” framework in an attempt to improve their IT service management processes. However, not all ITIL implementations are successful and some companies have been disappointed with the outcomes. This exploratory research reports on four case studies of “successful” implementations of IT service management using the process-based ITIL V2 framework. Two companies are located in the U.S. and two in Australia. The cases demonstrate a mix of implementation justifications and strategies. Critical success factors (CSFs) suggested in the literature are compared against those attributed to these successful ITIL implementations. Some CSFs, including executive management support, interdepartmental communication and collaboration, use of consultants, training and careful software selection are confirmed. Three new CSFs are identified: creating an ITIL-friendly culture, process as a priority, and customer-focused metrics. Practitioner guidelines, to assist IT managers, who are contemplating adopting ITIL for process improvement and organizational transformation, are also provided together with some challenges encountered and their associated resolutions.

Summary: The authors set out to determine how the ITIL framework is being implemented in public and private organizations. The authors performed a case study and interviewed the project/service managers for four separate companies; one from each sector in the U.S. and in Australia.

The authors identified that three of the four companies each suffered from a crisis that trigged their ITIL implementations. One faced severe outages and the others could not trace

failed change requests back to incidents. The authors also identified that the most successful of the two ITIL implementations worked with a big bang approach rather than a phased or parallel approach to rollout. The authors noted that the big bang approach appeared to be more appropriate for small organizations faced with shorter implementation periods and simpler initial setups.

The authors noted that the risks of implementation were mitigated by one of the companies through strong and explicit direction from senior management to start all of the processes over from scratch, one at a time. All four companies focused on change management as their first priority and each sought to communicate quick successes through internal communications such as newsletters. The authors found that the top two critical success factors for an ITIL implementation were executive support, which was unanimously identified as the top success factor; and ITIL training and staff awareness as a means of gaining buy-in from all stakeholders involved in the ITIL transformation. Other success factors the authors identified include:

- Interdepartmental Communication and Collaboration – the authors found that raising awareness across departments fosters communication and understanding.
- ITIL-Friendly Culture – the authors noted that while culture change is hard to manage, training, the removal of departmental silos that impact ITIL, and senior management direction can help to overcome resistance.
- Process as a Priority – the authors recommend focusing on the ITIL processes prior to selecting and implementing tools to support the processes.
- Customer-Focused Metrics – The authors cautioned against collecting data from outside organizations. Companies should measure their customer-focused data metrics internally and not gauge their ITIL successes based on competitors.

- Use of Consultants – The authors noted that all four organizations engaged external consultants who were ITIL experts to assist with the ITIL implementations. Despite some ill will expressed towards the consultants, the study participants identified their expertise as critical to success. One best practice was to ensure knowledge transfer from the consultants to the organization's staff.

The authors noted that difficulties encountered during the ITIL transition included employees having to perform the tasks of two separate key roles from the ITIL processes and their legacy processes, engaging the right people to make a proper culture shift, gaining support from technical staff due to new the requirement of adopting new processes and workflows, and measuring the return on investment for the ITIL transition.

This study provided a few key takeaways for this research paper. First, the authors state "Increasingly, external IT Service Providers are also adopting the ITIL framework, providing a common language and facilitating supplier management and seamless end-to-end services for users" (p. 170). This trend is important to note as the cost and complexity of ITIL can make it difficult for SMEs to implement and an external IT services vendor who provides the ITIL services may be a preferable option. The authors also mention using consultants for ITIL implementation as they have no investment in the legacy processes and can take a heavy-handed approach to implementation. In organizations where resistance to change is a large hurdle, this ability helps to overcome this problem. Finally, the authors call out the growing trend in outsourcing IT services to external service providers.

Tan, W., Carter-Steel, A., Toleman, M. (2009). Implementing IT service management: A case study focusing on critical success factors. *Journal of Computer Information Systems, 50*(2), 1-12. Retrieved from https://www.tandfonline.com/loi/ucis20

Abstract: Queensland Health, a large Australian government agency, implemented a centralized IT service management model based on the ITIL framework. This paper presents an in-depth case study of the implementation. It sheds light on the challenges and breakthroughs, confirms a set of factors that contributed to the project's success and offers a learning opportunity for other organizations. The study indicates that the commitment of senior management is crucial to the project's success as is a project champion and the recognition of the need for an appropriate change management strategy to transform the organizational culture to a service-oriented focus. Maintaining close and forthright relationships with multiple vendors facilitates technology transfer to in-house staff while a benefits realization plan is a valuable tool for tracking and communicating tangible and intangible project benefits to the project stakeholders. An effective project governance and execution process further contributes to the implementation success.

Summary: The authors perform a literature review of Queensland Health's (QH's) transition into ITIL. The authors seek to identify critical success factors (CSFs) by comparing an ITIL transition to an Enterprise Resource Planning (ERP) transition. The authors state that both business process migrations are similar for the following reasons:

- ERP and ITSM projects are expensive and risky,
- Both ERP and ITSM are sets of guidelines and best practices and can be customized to fit the needs of the business,
- Organizations implementing ERP and ITSM systems commonly use vendors for their implementations, and
- Change management is a common issue as both implementations require large workflow changes for staff in all departments.

The authors compiled 22 CSFs from Somers and Nelson's (2001) ERP studies and grouped them into five common themes: corporate management, vendors, organizational change (people and processes), project governance and execution, and ERP software. The authors then removed the ERP-specific CSFs from the list. The authors identified additional CSFs through a national Australia survey: senior management support, project champion, relationship with vendors, change in corporate culture, and project governance and execution.

The authors collected data from an ITIL adoption survey that was previously completed by QH staff and through interviews with three key members of the ITIL project team. The questions covered all core ITIL processes, details of the implementation strategy, and CSFs. Two years after those interviews, the authors conducted an additional interview with the QH ITIL project manager to confirm the results. The authors gathered secondary data in the form of public presentations and forums related to the project along with documents provided by QH, its websites, practitioner journals, and other online reports related to the ITIL project.

Queensland Health underwent two failed attempts at ITIL implementation prior to being successful. Even with strong senior leadership endorsement, the lack of clarity on the processes, insufficient training, and insufficient knowledge of process owners in key roles of the ITIL transition led to the eventual failure of the first two attempts. The implementation attempts were occurring in addition to the current workflows and processes that were in place, causing duplicate work with no advantages observed from the staff.

The CSFs that were identified in the beginning of the research were mostly verified during the study. While the CFSs of senior management support, project championship, change in corporate culture, and project governance all remained the same, the CSF for relationship with vendors was changed to relationship with multiple vendors to better highlight the need to work with multiple different entities at a time to succeed at the ITIL transition. One additional CSF

was identified as well: realization of benefits. By utilizing specific elements of the ITSM process design methodology, benefit deposit slips, a benefit register, and a benefit saving bank to highlight the tangible benefits from the ITIL adoption, the QH ITIL implementation team was able to maintain commitment to the project.

Conclusion

This annotated bibliography focuses on the challenges and critical success factors for a successful ITIL transition for an SME. The literature describes best practices, provides tools for measuring and monitoring the implementation and associated processes, and highlights difficulties that can be faced by an SME during an ITIL transition. Small and medium sized organizations that are considering the implementation of ITIL will gain insight into the value ITIL can provide to SMEs and the best practices to employ to ensure successful implementations and the realization of the associated value.

IT Service Management

Information Technology Service Management is "business-oriented service support, in which IT services are planned and managed according to their contributions to required business processes" (McNaughton et al., 2010, p. 219). Nabiollahi et al. (2011) identify and define four different IT Service Management frameworks:

- ITIL – provides guidance in defining a framework and guiding organizations to implement best practices in service management.
- ISO/IEC 20000 – focuses on guiding companies through best practices for implementing service delivery and service support processes exclusively.
- Microsoft Operations Framework (MOF) – seeks to guide companies through best practices and activities as they relate to the IT lifecycle: conception, development, operation, maintenance, and retirement.
- CMMI for Services – a collection of best practices put forth from government and industry that serves as a maturity model in service provider organizations (para. 6 – 9).

The Information Technology Infrastructure Library (ITIL) is the most popular and influential framework for applying ITSM (McNaughton, 2010). The Information Technology Infrastructure Library is a framework of management for businesses' information technology service management and operations; the ITIL framework is a set of processes, procedures, tasks, and checks to allow organizations and individuals to gain the most value from IT services (Axelos, n.d.). The ITSM processes are: (a) incident management, (b) problem management, (c) request fulfillment, (d) event management, (e) access management, (f) service desk, (g) change management, (h) release management, (i) configuration management, (j) service level management, (k) availability management, (l) capacity management, (m) IT service continuity management, (n) IT financial management, and (o) IT workforce management (Steinberg, 2013).

Liu et al. (2011) analyzed the 34 IT processes from the Control Objectives for Information and Related Technology (COBIT) framework created by the Information Systems Audit and Control Association (ISACA) to identify nine critical success factors of IT Service Management for a large IT services provider in China. Their CSFs are: (a) methodology, (b) process monitoring, (c) IT investment management, (d) IT solutions, (e) IT strategic planning, (f) data management, (g) system management, (h) project management, and (i) process monitoring. Liu et al. (2011) provided questionnaires to IT experts to identify the most critical success factors for service management at the company; of the original list of nine CSFs, they identified methodology, process monitoring, and IT investment management, respectively, as the most important of the success factors of ITSM.

Iden and Bygstad (2018) investigated the interrelated roles of IT developers and IT service management professionals to provide recommendations to ensure an optimal handoff from IT development to IT operations. Key implications for service management include a greater need for cooperation between development and operations staff during the development

project, formal coordination and planning involving both groups, and better training of and documentation for the IT operations staff on the new applications.

Benefits of ITIL

"Extensive research by AXELOS, involving a diverse group of stakeholders (+2,000), has consistently shown that ITIL is fundamental to businesses, enables transformation and helps organizations realize value" (Axelos, n.d., para. 6). Steinberg (2013) notes the following ITIL benefits:

- Enabling senior executives and management to make accurate and timely business decisions by providing indicators,
- Providing visibility into IT support and delivery services to gauge their effectiveness and efficiency,
- Providing a foundation to identify and prioritize IT service improvement enhancements,
- Enabling the surfacing of service deficiencies and problems through analytical information before they result in serious negative impacts,
- Providing a process-based root cause analysis to surface deficiencies in service operations, thus avoiding the assignment of blame to individuals,
- Providing senior management with confidence that IT is providing effective self-management, and
- Ultimately to prevent operational risk.

Through effective service management, risks such as service outages, rework, slow operational processes, dissatisfied customers, low employee morale, loss of revenue and sales, and unexpected costs can be mitigated and even avoided (Steinberg, 2013).

Success Factors when Implementing ITIL

While ITSM implementation best practices are detailed, they should not be considered a one-size-fits-all solution (Tan et al., 2009). Information Technology Service Management instead provides a list of best practices that can be custom tailored to the business that is performing the implementation (Tan et al., 2009). Three of the most important critical success factors on which organizations should focus when planning to implement an ITSM system are senior management support, project championship, change in corporate culture, and establishing relationships with multiple vendors (Liu et al., 2011; Tan et al., 2009).

By identifying critical success factors for ITIL implementations, an organization can plan and execute the implementation phases of an ITIL transition more effectively (Pollard & Cater-Steel, 2009). Two separate studies both identified the top two critical success factors for an ITIL implementation as executive support; both studies also identified the provision of ITIL training and staff awareness of ITIL as other critical success factors (Iden & Langeland, 2010; Pollard & Cater-Steel, 2009). Other success factors for ITIL implementations include:

- Interdepartmental Communication and Collaboration – raising awareness across departments fosters communication and understanding.
- ITIL-friendly Culture – while culture change is hard to manage, training, the removal of departmental silos that impact ITIL, and senior management direction can help to overcome resistance.
- Process as a Priority – focus on the ITIL processes prior to selecting and implementing tools to support the processes.
- Customer-focused Metrics – avoid collecting data from outside organizations; companies should measure their customer-focused data metrics internally and not gauge their ITIL successes based on competitors.

- Use of Consultants – the expertise of external consultants can be critical to a successful ITIL implementation. A related best practice is to ensure knowledge transfer from the consultants to the organization's staff. (Pollard & Cater-Steel, 2009

Melendez et al. (2016) caution that simply identifying the critical success factors will not be enough; the organization must understand the problem it is attempting to solve or have clear business goals identified prior to attempting an ITSM implementation. The organization also needs to put forth effort into fully investigating the following items prior to beginning the planning of an ITSM implementation (Melendez et al., 2016):

- Needs, problems, and business goals – items such as a determination of needs and how to align the adoption with business objectives,
- Training – staff members who are well trained in ITIL leads to better adoption and implementation,
- Definitions – defining the service level catalog and service level agreements,
- Model – identifying which ITSM framework will best serve the business' structure and goals, and
- Other – Senior management buy-in and identification of key roles and responsibilities.

For those organizations that do not currently engage in formal IT Service Management, transitions to ITSM are both risky and costly and can oftentimes end in failure if proper planning is not observed (Tan et al., 2009). Tan et al. (2009) provide an example of the risks and the potential consequences associated with ITSM implementations in their review of Queensland Health's two failed ITSM implementation attempts prior to their eventual successful implementation. Even with strong senior leadership endorsement, the lack of clarity on the processes, insufficient training, and insufficient knowledge of process owners in key roles of the

ITIL ITSM transition led to the eventual failure of the first two attempts (Tan et al., 2009). The attempts to implement the new ITSM workflows and processes were occurring while staff were still engaged in the existing IT service workflows and processes, causing duplicate work with no advantages observed by the staff (Tan et al., 2009).

Despite senior leadership buy-in to the ITSM implementation, which Tan et al. (2009) noted as one the top implementation critical success factors, there was a clear lack of communication and relationship building between Queensland Health and their vendors during the first two failed implementations. Vendors can offer a significant advantage to an ITSM transition by bringing in outside experience and knowledge from other transitions in which they have participated (Tan et al., 2009). By building strong relationships with these vendors, an organization can drastically increase their chances of a successful ITSM migration.

Proper planning alone will not lead to full success for a company who wishes to implement ITSM. Strong IT operations involvement to properly size and design the new supporting infrastructure (Iden & Bygstad 2018), proper process and investment monitoring (Liu et al., 2011), and letting go of the old workflows throughout the implementation process (Tan et al., 2009) are also key factors to ITSM success.

With the complexity, cost, and risk involved with a full ITSM implementation, it is important to introduce the idea of Service Oriented Architecture (SOA) (Nabiollahi et al., 2011), despite the fact that SOA falls outside of the scope of this study. While the ITSM framework seeks to solve problems through the management of services, SOA focuses on proper service design instead (Nabiollahi et al., 2011). Given that budgetary constraints often hit SMEs, it could be beneficial for SMEs to explore the implementations of some SOA processes, along with the implementation of ITSM (Nabiollahi et al., 2011).

ITIL and SMEs

The Information Technology Infrastructure Library provides benefits in supporting legal compliance, risk management, cost savings, and the ability to satisfy customers more effectively (Marrone et al., 2014) and thus is very appealing to SMEs whose limited budgets force them to investigate new ways to do more with less (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). The benefits of ITIL, combined with the ability to pick and choose specific processes from the ITIL standard to implement, enable an SME to perform scaled-down implementations of the same framework of larger organizations (Lema et al., 2015; Lema-Moreta & Calvo-Manzano, 2017; Machado et al, 2012).

Machado et al. (2012) advocate that SMEs implement the ITIL Incident Management processes first, as they are the single best set of processes for an SME to see the most return on their investment into the ITIL framework, both in monetary and customer service results. This success is due to the fact that incident management has the highest visibility throughout the organization and the core structure of the incident management processes is focused on increasing customer service (Lema et al., 2015). Because of this high visibility, with a successful implementation of the incident management process the leadership team championing ITIL adoption can encourage justify the additional expenditure on other processes in the ITIL pipeline (Lema-Moreta & Calvo-Manzano, 2017).

Just as the ITIL framework can be broken down into processes, the incident management process can be broken down even further into the nine specific activities that can provide the most value to SMEs with the least amount of monetary- and knowledge-based investments:

- Incident Identification,
- Incident Logging,
- Categorizing the Incident,
- Assigning Priority,

- Initial Diagnosis Activity,
- Incident Escalation,
- Investigation and Diagnosis,
- Resolution and Recovery, and
- Incident Closure. (Lema-Moreta & Calvo-Manzano, 2017)

But simply identifying the best path to success will not guarantee that an SME will be successful in their ITIL implementation. The complexity, cost, and risk to implement such a large IT change can carry a heavy burden for SMEs (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016). Information Technology Infrastructure Library transitions can be complicated, with difficulties for all sizes of organizations, but some of the most prevalent hurdles for SME implementations include:

- Difficulties in recruiting ITIL talent,
- Complex framework,
- Lack of awareness on the need to optimize IT processes,
- Lack of resources present in SMEs,
- Lack of knowledge of the model, and
- Lack of motivation. (Melendez et al., 2016)

Marrone et al. (2014) assert that small organizations should not be considered to be "scaled-down versions of large firms" (Marrone et al., 2014, p. 49) and that process improvement models, including ITIL, may not be appropriate for small businesses. Marrone et al. (2014) identify anecdotal evidence of specific issues with ITIL deployments within SMEs, including documentation overload, flat management structures that find difficulty in supporting the ITIL processes, high resource requirements, high training costs, and lack of needed guidance.

Cruz-Hinojosa & Gutierrez-de-Mesa (2016) and Marrone et al. (2014) observe that, historically, tools to monitor metrics related to ITIL have been costly and out of reach for SMEs. However, Steinberg (2013) notes that less robust entry level tools have been entering the market to assist smaller IT budgeted companies in entering the ITSM realm.

Final Thoughts

Implementing a successful ITIL transformation in any organization takes a significant amount of planning, commitment, and resources that can strain even the largest companies (Cruz-Hinojosa & Gutierrez-de-Mesa, 2016; Lema et al., 2015; Pollard, & Cater-Steel, 2009). These difficulties can be compounded by the lack of knowledge of the intricacies of ITIL within an SME (Cruz-Hinojosa & Guitierrez-de-Mesa, 2016; Lema et al., 2015). Because an ITIL transition requires a large investment and buy-in from not just the IT department and senior leadership, but the all members of the organization, the transition into a service management framework is a very large undertaking (Cruz-Hinojosa & Guitierrez-de-Mesa, 2016; Lema et al., 2015; Machado et al., 2012). For smaller organizations, these implementation factors are compounded by the fact that SMEs typically do not possess the number of personnel or infrastructure necessary to support the regular maintenance and documentation requirements of an ITIL transition (Marrone et al., 2014). However, the rising use of IT contractors and vendors can provide a door into the benefits of ITIL for SMEs at a fraction of the investment (Lema et al., 2015; Tan et al., 2009). Information Technology service providers who can focus their service-based management on their clients can be a valuable asset to SMEs who wish to reap the benefits of ITIL without having to undergo the implementation alone (Lema et al., 2015; Machado et al, 2012).

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