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Marrone, Mauricio and Kolbe, Lutz M., "ITIL and the Creation of Benefits: An Empirical Study on Benefits, Challenges and Processes" (2010). *ECIS 2010 Proceedings*. 66.

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Journal:	<i>18th European Conference on Information Systems</i>
Manuscript ID:	ECIS2010-0218.R1
Submission Type:	Research Paper
Keyword:	IT service management, IT services, Business value of IS/value of IS, Service science



ITIL AND THE CREATION OF BENEFITS: AN EMPIRICAL STUDY ON BENEFITS, CHALLENGES AND PROCESSES

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Abstract

Over 90 percent of companies are estimated to use IT Service Management (ITSM) frameworks, yet there is little research on their benefits to the Information Technology (IT) department and the business units. An international survey of 503 firms was conducted to examine the benefits of the IT Infrastructure Library (ITIL), the de-facto ITSM framework, specifically on how these benefits evolve as companies increase their adoption of the ITIL model. Also studied are the perception of challenges of the implementation and the number of ITIL processes implemented in relation to the progress of the adoption of ITIL. Results indicate that as the maturity of implementation increases, the perception of challenges decreases. Findings also show that as the maturity of implementation increases, the number of realized benefits increases, as well as the number of implemented ITIL processes. Implications for practitioners and researchers are also discussed.

Keywords: IT Infrastructure Library, IT Service Management, Benefits, Challenges, Best Practices, ITIL, ITSM, IT Services

1 INTRODUCTION

In 1980, when listing the critical success factors of Information Systems (IS), Rockart (1980) argues that “the first, and most obvious, IS critical success factor is service”. The Information Technology (IT) departments in many organizations were previously focused on the production of software applications, and in the late 1980s it started to change to a service mode of operation. For IT Service Management (ITSM), the main focus is not on the development of IT applications, but rather on the management of IT services.

Several studies have focused on the adoption of ITSM as well as specific service oriented IT management concepts. One study estimated that 90% of United States companies are considering or currently using an ITSM (Galup et al. 2009). In a more specific research, the IT Government Institute (2008) estimates that the ITSM framework with the highest adoption rate is IT Infrastructure Library (ITIL), with 24%, followed by Control Objectives for Information and related Technology (CobiT) with an adoption rate of 14%.

Additional to the rising adoption rates of ITSM, a factor to look at is the costs entailed by IT Services. IT Services account for an estimated 70% to 80% of the expenditure of an IT organization (Orlov 2005). Therefore practitioners and researchers are interested in understanding the possible benefits realized by companies which adopted an ITSM, specifically in the case of those companies that have adopted ITIL. Moreover, importance is given to the understanding of how these benefits evolve as companies increase the adherence to the guidelines to the ITIL model. Also of interest is the perception of challenges of implementing ITIL, and as expressed previously, how the perceptions of challenges develop as companies increase their adherence to the model. The last point is to understand how the implementation of ITIL processes affects the maturity of the implementation of ITIL.

So far there have been no academic studies on this matter, and the research methodology of a large scale international survey has not been employed. Therefore, this research, using empirical data gathered from a survey with major companies from various industries, sets out to understand the following:

- Which effect does the total number of implemented processes have on the maturity of the ITIL implementation?
- How are challenges perceived at different levels of maturity of the ITIL implementation?
- How does the total number of realized benefits develop as the maturity of the ITIL implementation increases?

Consequently, this article begins with a literature review on IT Service Management, on processes of ITIL, as well as benefits and challenges of implementation. This is followed by a description of the methodology used for this research. Results of the survey are then analyzed and outcomes are discussed. Before the limitations and the future research sections, conclusions are drawn.

2 LITERATURE REVIEW

ITSM is a part of the Service Sciences that concentrates on IT Operations (Galup et al. 2009). It can be defined as “a set of processes that cooperate to ensure the quality of live IT services, according to the levels of service agreed to by the customer” (Young 2004).

Academic research on ITSM is still in its early stages despite its numerous appearances in the popular press and practitioners’ magazines. Existing academic literature merely presents the description of the areas documented on ITIL (Cervone 2008; Hendriks & Carr 2002) or analyzes adopters of ITIL through case studies (Hochstein et al. 2005; Cater-Steel, Tan et al. 2006; Kießling et al. 2009). A few

researchers have covered the topic of ITIL benefits, challenges of implementation and the effectiveness of ITIL. Relevant academic research is shown in Table 1.

Author and Year	Approach	Issues Addressed in Study
Hochstein et al., 2005	Qualitative	In the analysis of their six case studies, the researchers list the following four benefits: improvement of quality of IT services, efficiency and optimization of processes, as well as transparency and comparability through process documentation and process monitoring.
Potgieter et al., 2005	Qualitative	Completes research on the effect of the implementation of ITIL on customer satisfaction and service quality. The researchers conclude that in the research site, a large service unit of ICT in South Africa, there is a direct correlation between customer satisfaction, service quality and the use of ITIL.
Brenner, 2006	Conceptual	Proposes ways of how the ITIL process can be implemented in efficient ways with process-oriented tools such as workflow management systems.
Cater-Steel, Tan et al., 2006	Conceptual and Quantitative	Describes processes such as ITIL, CobiT, CMMI and ISO 9001 as well possible motivations and challenges for their adoption.
Cater-Steel et al., 2006	Qualitative	In a case study of six companies they describe the challenges of adopting ITIL to be the following four factors: lack of management support, cultural change in terms of resistance, delays in choosing an appropriate tool, and management problems for resources such as time, people and money.
Spremic et al., 2008	Qualitative	Monitors an IT Service provider in Croatia and applies various Key Performance Indicator (KPI) metrics before and after the implementation of various processes of ITIL. The study concludes that the IT service provider undergoes improvements which may be attributable to the implementation of ITIL.
Cervone, 2008	Conceptual	Provides overview of ITIL and suggest the following three benefits of ITIL: cost reduction, improving customer satisfaction and improving the productivity of the IT department.
Kießling et al., 2009	Qualitative	Completes six expert interviews and conclude that the following six factors are benefits of an ITIL adoption: improvement of customer satisfaction, improvement of internal processes, standardization of processes, improvement of service quality, increase of efficiency, and improvement of return on investment.
Galup et al., 2009	Conceptual	Presents an overview on ITSM, their global impact and the current initiatives

Table 1. Relevant research on ITSM and ITIL

A summary of the benefits of ITSM and ITIL found in literature sources are displayed in Table 2.

Improvement of...	Hochstein et al., 2005	Potgieter et al., 2005	Kießling et al., 2009	Cater-Steel et al., 2006	Cervone, 2008
Service Quality	X	X	X	X	X
Standardization of Service	X		X	X	
Customer Satisfaction		X	X	X	
Return on Investment			X	X	X
Reduction of Downtime				X	X
Best Practice	X				
Financial Contribution Control				X	
Call Fix Rate				X	
Morale of IT				X	

Table 2. Summary of Benefits of ITIL

To comprehend in which level of adherence or maturity companies are in when adoption the ITSM model, various researchers, including Cater-Steel et al. (2006) and Kießling et al. (2009) have used the Maturity Model. The Maturity Model presented on these studies is based on the model from CobiT and Capability Maturity Model Integration (CMMI). These levels are intended as profiles of IT processes, and companies would identify these levels as a description of their current state. The model is divided in levels which range from *non-existent* (0) to *optimized* (5). At the lowest level of the maturity model, the management processes are not applied at all. This level is known as *non-existent* (0) implementation. At the following level, named *Initial*, processes are ad hoc and disorganized.

Level 2 is referred to as *repeatable*, where the processes follow a standard, are documented and understood. Level 3 is where processes are documented and monitored for compliance. This level is known as *defined*. Level 4, known as *managed*, is one where management monitors and measures according to metrics established in the previous level. The highest level of maturity is known as *optimized*; this is where good practices are followed and automated.

Until now, there has been no research which has involved the benefits, challenges and implementation of processes as well as their relation to the maturity of the ITIL implementation. Apart from that, the methodology of a large scale survey for various countries has not been utilized. This literature review leads to the research propositions which are presented in the following section.

3 RESEARCH DESIGN

For the three questions listed in the introduction, a total of five propositions are described. These are described below.

3.1 Implemented Processes and Maturity Level

The relation between the number of implemented processes and the levels of maturity is of interest for this research. Since the number of processes varies depending on the version, each version is analyzed separately. To understand the effect of the total number of implemented processes on the maturity level of implementation, two possible propositions were initially suggested. Only one of the two propositions was then selected by the researchers. One possible proposition is that companies would select and implement processes which would, in their opinion, provide the companies with the biggest benefits, or processes that would help them deal with areas in which they are performing deficiently. Companies that have implemented only some of the processes would then report the maturity level of their ITIL implementation based on the maturity of those processes which they have implemented, rather than on the whole ITIL process. Conversely, another possible proposition is that the maturity of the implementation of ITIL is based on the full lifecycle model. Therefore, rather than concentrating on the maturity of their implemented processes, the perception of maturity level would be based on the completed ITIL model. Hence, the higher the number of implemented ITIL processes, the higher the maturity of the ITIL implementation. In this research, we support the later. The proposition is:

P1: There is a positive relationship between implemented processes and perceived maturity of the ITIL implementation.

3.2 Perceived Challenges and Maturity Level

This research aims to understand which effect, if any, maturity levels have on the perceived challenges of implementation. The proposition of the effect of the perceived challenges on the level of maturity is based on the model of the learning curve effect. The learning curve, also known as the experience curve, is a phenomenon which was initially observed by Wright (1936). He observed that as the quantity of units manufactured doubles, the number of hours of direct labor required to produce an individual unit decreases at a uniform rate. Wright also argued that the learning can occur for the production of any good or service. Applying this model to our proposition we can assume that the organization gains experience dealing with the challenges and becomes more efficient as it progresses in its learning, allowing for the perception of the challenges to decrease over time. Therefore, our proposition is formulated as follows:

P2: There is a negative relationship between maturity levels of the ITIL implementation and perceived challenges of implementation.

3.3 Number of Realized Benefits and Maturity Levels

This question focuses on understanding the total number of realized benefits due to the implementation of ITIL for each company. Rather than concentrating on the individual benefits which were surveyed, the focus of this research is to understand the progression of the total number of realized benefits for the companies. Consequently, for each company, benefits which they realize are added up. The same approach is used for the number of benefits supported by metrics and the number of benefits acknowledged by the business.

We believe that, initially, the benefits provided by ITIL will be noticed by IT, and that metrics will not be used at earlier stages. At the following levels, these benefits will be supported by metrics and may also be acknowledged by the business.

For this proposition, the Law of Diminishing Returns is taken into consideration. It suggests that the continued improvement efforts towards a specific project or goal would lead to a decline in effectiveness after a particular level of result has been accomplished (Drucker et al. 1998). In other words, after a certain level of standardization, increasing the standardization further provides few additional benefits. Consequently, the following proposition is suggested:

P3a: There is a positive relationship between maturity levels of the ITIL implementation and perceived realized benefits.

We also expect that the number of realized benefits which are supported by metrics will be used on the later levels of maturity, rather than on the initial levels of maturity. Similarly, the business may recognize the benefits of the ITIL implementation in the later levels of adoption, possibly due to a better Business-IT alignment, which is a proposed benefit of ITIL. Therefore, the following propositions are suggested:

P3b: There is a positive relationship between maturity levels of the ITIL implementation and usage of metrics to measure the realized benefits.

P3c: There is a positive relationship between maturity levels of the ITIL implementation and acknowledgement by the business of the realized benefits.

4 METHODOLOGY

The online questionnaire was made available in the months of April and May 2009. An invitational email was sent to companies that were in the mailing lists of Hornbill¹ and the IT Service Management Forum² (itSMF) in the United States of America and United Kingdom. Additionally, this survey was announced in various internet groups and forums. The survey targets ITSM champions. Because the champion actively supports and promotes the project they would have the knowledge about the entire implementation of the ITSM in the company as well as the benefits that were provided. Out of the 784 IT executives who started to fill out the survey, 503 completed and submitted the survey. Partially completed surveys were not used for the study. The sample size is of 503, unless specified otherwise.

The structure of this questionnaire addressed many aspects of ITIL, its adoption, usage, implementation and maturity, as well as effectiveness of processes and realized benefits. It also entails the topics of Business-IT alignment and service desk usage. The survey contains mostly questions whose answers are in Likert scale, nominal scale and open-ended answers form.

First, those surveyed were asked to rate the perception of the maturity of their ITIL process on a scale based on the CobiT and CMMI maturity.

¹ IT Service Management Software provider, <http://www.hornbill.com/>

² Forum for ITSM professionals, <http://www.itsmf.co.uk/>

5.2 Empirical Results

An exploratory analysis was conducted for each variable to test for normality. Both, the Kolmogorov-Smirnov and the Shapiro-Wilk showed significance for versions of ITIL ($p < 0.001$), for all of the variables of challenges of adoption of ITIL ($p < 0.001$) and for the realized benefits of ITIL ($p < 0.001$). Due to the data being non-normal, the Kruskal-Wallis, a non-parametric one way analysis of variance, was used to study the data. If the data using the Kruskal-Wallis showed significant differences between the groups, the Mann-Whitney U test was used.

Since using a large quantity of Mann-Whitney tests will inflate the Type I error rate, only a selective comparison will be carried out. The suggested comparisons will be between the first and middle level of maturity, the first and last level of maturity, and between the middle and final level of maturity. Therefore the following three tests will be conducted:

- Test 1: Initial (1) level compared to Defined (3) level
- Test 2: Initial (1) level compared to Optimized (5) level
- Test 3: Defined (3) level compared to Optimized (5) level

The reason for the selection of these tests is that the research concentrates on how the variables progress as the maturity of the ITIL implementation increases.

Since three tests will be conducted, a Bonferroni correction was applied. Due to this correction, rather than using the critical level of significance of 0.05, all effects are reported at 0.0167 level of significance. All reported p values are using 2-tailed Monte Carlo p values with a confidence level of 99% and a number of samples of 10,000. This method is used because of the large sample size.

Additionally, to understand the trends in the data the Jonckheere-Terpstra test was used. Lastly, r was used to measure the strengths of a relationship between variables (Rosenthal 1991, p.19). Cohen suggests that the sizes of the effect are small (0.1), medium (0.3) or large (0.5). The negative sign for the r demonstrates that the data lies on a straight line with a negative slope.

In the next sections the following abbreviations are used: H corresponds to the Kruskal-Wallis statistic, U represents the Mann-Whitney U statistic, while J symbolizes the observed J-T statistic.

5.2.1 Implemented Processes and Maturity Level (P1)

The number of implemented processes for both versions of ITIL, Version 2 ($n=248$) and Version 3 ($n=193$), are studied to understand the effect on the level of maturity of implementation. In general, the numbers of implemented processes significantly affect the maturity level of the implementation (Version 2 $H(4)=99.03$, $p < 0.001$, Version 3 $H(4)=82.108$, $p < 0.001$). Mann-Whitney U tests were used to follow up on the findings.

Table 4 shows that the number of implemented processes is significant when comparing the Initial level (1) with the Defined level (3). The same occurs when comparing the Initial level (1) with the Optimized level (5). When comparing the Defined level (3) with the Optimized level (5) significance was also observed. Using Cohen's benchmark, we observe that there is a medium to large change on the number of implemented processes as maturity increases.

With the help of Jonckheere's test a significant trend in the data can be observed, as the level of maturity goes up, the median of number of implemented processes increases. (Version 2: $J=18001$, $z=10.49$, $r=.67$, Version 3: $J=11398$, $z=9.63$, $r=.69$)

In conclusion, regardless of the version of ITIL implemented, as the level of maturity goes up, the number of implemented processes also ascends.

Implemented processes of ITIL	Implementation level medians			Initial (1) level compared with Defined (3) level			Initial (1) level compared with Optimized (5) level			Defined (3) level compared with Optimized (5) level		
	Initial	Defined	Optimized	U	p	r	U	p	r	U	p	r
ITIL Version 2	2	4.5	10.0	98.5	0.000*	-0.44	12	0.000*	-0.73	323.5	0.000*	-0.58
ITIL Version 3	2	11.0	16.5	75.5	0.000*	-0.68	83	0.000*	-0.61	345.0	0.013*	-0.30

* significance at 0.0167

Table 4. Mann-Whitney test results for ITIL versions and maturity levels

5.2.2 Perceived Challenges and Maturity Level (P2)

In general, challenges of adopting ITIL are significantly affected by the implementation maturity of ITIL: Lack of executive sponsorship $H(4)=37.75$, $p<0.001$, Business understanding of ITIL objectives $H(4)=42.19$, $p<0.001$, Lack of resource, time or people $H(4)=32.39$, $p<0.001$, Lack of internal knowledge and skills relating to ITIL $H(4)=42.86$, $p<0.001$, Lack of funding / cost of adoption $H(4)=14.21$, $p<0.01$, Organization / culture resistance to change $H(4)=33.41$, $p<0.001$, Maintaining momentum / progress stagnates $H(4)=18.88$, $p<0.005$. Mann-Whitney tests were also used to follow up this finding.

Table 5 shows the results from the selective comparisons. It can be observed that between levels Initial (1) and Defined (3) there was significance for Business understanding of ITIL objectives, Lack of resource, time or people, Lack of internal knowledge and skills relating to ITIL, and Organization / culture resistance to change. Based on Cohen's benchmark, a small to medium change can be seen on the lowering of the perception of challenges as maturity increases. However, no significance could be shown for Lack of executive sponsorship, Lack of funding / cost of adoption and Maintaining momentum / progress stagnates.

When comparing the Initial (1) with Optimized (5) significance can be observed for all variables with a medium effect size: Lack of executive sponsorship, Business understanding of ITIL objectives, Lack of resource, time or people, Lack of internal knowledge and skills relating to ITIL, Lack of funding / cost of adoption, Organization / culture resistance to change, Maintaining momentum / progress stagnates.

Lastly, comparing the Defined (3) with the Optimized (5) maturity level, significance can be observed for Lack of executive sponsorship, Business understanding of ITIL objectives, Lack of resource, time or people, Lack of funding / cost of adoption, Organization / culture resistance to change. Marginal significance can be observed for Lack of internal knowledge and skills relating to ITIL and Maintaining momentum / progress stagnates.

Challenges	Implementation level medians			Initial (1) level compared with Defined (3)Level			Initial (1) level compared with Optimized (5) Level			Defined (3) level compared with Optimized (5) Level		
	Initial	Defined	Optimized	U	p	r	U	p	r	U	p	r
Lack of Executive sponsorship	3	3	2	3375.0	0.189	-0.10	1104.5	0.000*	-0.34	2492.0	0.001*	-0.25
Business understanding of ITIL objectives	4	3	3	2736.5	0.001*	-0.24	993.0	0.000*	-0.40	2634.0	0.003*	-0.22
Lack of resource time or people	4	4	3	2756.5	0.001*	-0.24	894.0	0.000*	-0.45	2496.5	0.001*	-0.26
Lack of internal knowledge / skills relating to ITIL	4	3	2	2461.0	0.000*	-0.30	977.5	0.000*	-0.40	2884.5	0.031	-0.16
Lack of funding / cost of adoption	3	3	3	3433.0	0.254	-0.09	1234.0	0.002*	-0.28	2724.5	0.008*	-0.20
Organization / cultural resistance to change	4	3	3	2825.5	0.003*	-0.22	1017.5	0.000*	-0.39	2785.0	0.014*	-0.18
Maintaining momentum / progress stagnates	4	4	3	3419.5	0.225	-0.09	1245.0	0.003*	-0.28	2869.0	0.027	-0.17

* significance at 0.0167

Table 5. Mann-Whitney test results for perception of challenges and maturity levels

Jonckheere's test revealed a significant trend in the data. As the level of maturity goes up, the median of challenges decreases (Lack of executive sponsorship $J=36500$, $z=-5.9$, $r=-.26$, Business understanding of ITIL objectives $J=35298$, $z=-6.6$, $r=-.30$ Lack of resource, time or people $J= 37332$, $z=-5.5$, $r=-.25$, Lack of internal knowledge and skills relating to ITIL $J= 35233$, $z=-6.7$, $r=-.30$, Lack

of funding / cost of adoption $J=40536$, $z=-3.6$, $r=-.16$, Organization / culture resistance to change $J=36699$, $z=-5.8$, $r=-.26$, Maintaining momentum / progress stagnates $J=39816$, $z=-4.0$, $r=-.18$)

We can conclude that the perception of difficulty when facing the challenges studied in this research reduces as the maturity of implementation increases. The challenge of Maintaining momentum / progress stagnates is the only factor that has no significance when examining the Initial (1) and Defined (3) levels, and only marginal significance when comparing the Defined (3) and Optimized (5) levels. However, when examining the Initial (1) and Optimized (5) level significance does exist. When examining the variables Lack of executive sponsorship and Lack of funding / cost of adoption one can observe that in the lower levels of implementation one can detect no significance. However, when comparing the Defined level (3) with the Optimized level (5) significance can be observed.

5.2.3 Number of Realized Benefits and Maturity Levels (P3)

When conducting the Kruskal-Wallis test, the number of realized benefits is significantly affected by the level of implementation maturity ($H(4)=134.49$, $p<0.001$ for the total number of realized benefits, $H(4)=139.37$, $p<0.001$ for realized benefits using metrics, $H(4)=91.64$, $p<0.001$ for realized benefits acknowledged by the business).

As shown in Table 6, the number of realized benefits is significantly higher when comparing the Initial (1) with the Defined (3) level of maturity of implementation. Based on Cohen's benchmark, there is a large change on the number of realized benefits as maturity increases. One can also observe this when comparing the Initial (1) with the Optimized (5) level. Finally, when comparing the Defined (3) with Optimized (5) level no significance can be determined. Yet, significance can be observed when examining the number of realized benefits that have been obtained by using metrics as well as when observing the number of realized benefits that have been acknowledged by the business.

Jonckheere's test shows a significant trend in the data, as the level of maturity goes up, the median of number of realized benefits increases ($J=66553$, $z=11.44$, $r=.52$), the median of number of realized benefits backed by metrics increases ($J=67164$, $z=11.69$, $r=.54$), and finally, the median of number of realized benefits acknowledged by business increases ($J=62730$, $z=9.73$, $r=.44$).

We can conclude that as the level of maturity increases, so does the number of realized benefits and in later levels of maturity, specifically between the maturity Defined (3) and the Optimized (5) level, companies concentrate more on using metrics and on showing the realized benefits to the business.

Benefits	Implementation level medians			Initial (1) level compared with Defined (3) level			Initial (1) level compared with Optimized (5) level			Defined (3) level compared with Optimized (5) level		
	Initial	Defined	Optimized	<i>U</i>	<i>p</i>	<i>r</i>	<i>U</i>	<i>p</i>	<i>r</i>	<i>U</i>	<i>p</i>	<i>r</i>
Number of realized benefits	0	4	5	980.5	0.000*	-0.61	434.0	0.000*	-0.67	2956.5	0.060	-0.14
Number of benefits backed by metrics	0	2	4	1209.5	0.000*	-0.57	478.5	0.000*	-0.67	2529.5	0.002*	-0.24
Number of benefits acknowledged by the business	0	1	3	2099.0	0.000*	-0.40	658.0	0.000*	-0.59	2511.5	0.001*	-0.24

* significance at 0.0167

Table 6. Mann-Whitney test results for realized benefits and maturity levels

6 DISCUSSION

The results of the current study confirm P1. P1 states that as more processes of ITIL are implemented, the maturity of ITIL increases. It can be observed that there is a positive direct influence between the number of implemented ITIL processes and the maturity level of the ITIL implementation. This result may also give an insight on how ITIL adopters are implementing the ITIL processes, which is on increasing implementation of processes rather than of implementing all processes at once.

In general, the second proposition (P2) is also confirmed. This proposition states that the perception of the listed challenges of implementation would decrease as the maturity levels of implementation increase. This can be due to the fact that as adopters overcome the initial challenges of implementation, experience is gained, and future challenges are perceived to be less complex than those in the earlier levels. As well, it follows the pattern of the learning curve model, where at the initial levels there is a difficulty in undergoing the implementation, yet, as experience is gained, these difficulties decrease.

Another possibility can be that these challenges are reduced because the benefits of ITIL are made evident to the business and those involved in the project of implementation. As explained by Huber (1991), organization learning occurs to a larger extent when the knowledge obtained is recognized to be useful. In other words, the organization is more likely to learn if there are benefits presented to the individuals and to the organization. In the case of this study, the reason why the challenge perception decreases over time may also be due to the benefits shown by the implementation, which may encourage the organization and individuals to learn and to implement further processes.

When looking specifically at the listed challenges, challenges such as Lack of executive sponsorship, Lack of funding, and Maintaining momentum / project stagnates show no significance when comparing the maturity levels of implementation Initial (1) and Defined (3). However, when the maturity levels of implementation Defined (3) and Optimized (5) are compared, these challenges decrease. This may be due to the fact that at the earlier levels, the business has yet to feel the benefits and scepticism exists. Conversely, in the later stages of implementation, once the business has acknowledged benefits of the ITIL implementation, it is likely to support further implementation of ITIL.

When comparing the maturity levels of implementation Defined (3) and Optimized (5), marginal significance can be observed in the challenges such as the Lack of internal knowledge and skills and Maintaining momentum / project stagnates. In the case of Lack of internal knowledge and skills, this could be due to the fact that acquiring personnel that has specialized knowledge in this field may be difficult, or that the training programs, being new, are not often available. Maintaining momentum / project stagnates is the only challenge that was not proven statistically significant in two of the three comparisons, the two being the comparison between Initial level (1) and the Defined (3) as well as the comparison of Defined level (3) and Optimized (5). This indicates that throughout the project this challenge must be the focus of IT Managers and may be a critical success factor for the implementation. As well, this factor can be considered to be independent from the ITIL implementation and may be a factor attributed to those executing the implementation of ITIL.

Finally, results from P3a, P3b and P3c also showed to be statistically significant, yet, in general, the law of diminishing returns could not be observed. The fact that there are benefits due to the adoption of ITIL agrees with the results from individual case studies on the effectiveness of ITIL presented by Potgieter et al. (2005) and Spremic et al. (2008). As reported by Hochstein et al. (2005), "Quick wins" are critical success factors when implementing ITIL. Thus, some companies may be attempting to realize benefits in the lower levels of implementation.

As it can be observed from the results of P3a, the number of realized benefits increases as the maturity level increases. However, there was no significance when comparing the Defined (3) with the Optimized (5) level of the ITIL implementation. Therefore, looking only at this result the law of Diminishing Returns for the studied benefits of ITIL appears to apply.

Nevertheless, with the results of P3b and P3c we cannot prove that the law of Diminishing Returns applies. As revealed from the results of P3b, the usage of metrics occurs even in the later levels of implementation. It has been shown that using performance metrics leads to improved decision making and problem solving (Banker et al. 2004), allows the survival and prosperity of organizations (Kaplan & Norton 1996) as well as encourages the renovation of strategy (Neely et al. 1994). Therefore, the usage of metrics provides indirect benefits of implementation in the later levels.

Moreover, that the benefits of ITIL are acknowledged by the business (P3c), even in the later levels of the ITIL implementation, may endorse the view that ITIL contributes to the Business-IT alignment. This would lead the business to a greater understanding about the general benefits and value that IT provides to the enterprise. Other indirect benefits of the ITIL implementation conveyed by a higher Business-IT alignment include: a positive effect on business performance (Sabherwal & Chan 2001), a competitive advantage and increased profitability (Henderson et al. 1996) as well as it being one of the key factors for successful IT systems implementations (Boynton et al. 1994; King & Sabherwal 1992; Lederer & Sethi 1988).

The contribution to research is that it delivers insight into the perception of effectiveness of ITIL, the implementation of processes and the evolution of challenges, as well as filling a research gap. Additionally, this research opens the path for future research. In practice, the findings can serve as a guideline for those IT managers considering or who have already adopted ITIL. For those considering the adoption and having doubts on the benefits of ITIL, the results show that due to the implementation of ITIL companies do receive several benefits. For those IT departments that have adopted ITIL and ponder on the idea of expanding their implementation of ITIL, they are provided with the understanding of the evolution of benefits realizable, and how their perception of challenges of implementation is affected as they continue implementing ITIL.

7 CONCLUSION

Based on the results reached in the previous sections, it has been shown that as the maturity of the ITIL implementation increases the number of implemented processes also increases. Additional to this, as the maturity increases, the challenges of implementation decrease. This is explained using the learning curve as well as insights from organizational learning. Results conclude that as the maturity of ITIL increases, so does the number of realized benefits. Marginal returns can be observed after the implementation reaches the Defined (3) level. Yet, in later levels of implementation further returns of the ITIL implementation can be seen. In these later levels there is an increase in the usage of metrics to measure the benefits of the implementation as well as in the business acknowledging the benefits provided by IT.

Limitations of this study are that the study concentrates only on the United States and United Kingdom, and that it over-samples the larger enterprises. Another limitation is that empirical studies are dependent on the quality of data provided by the respondents. Additionally, the paper uses a perceived maturity which is based on a single measurement. As well, the results are based only on the challenges and benefits that were listed on the survey.

Since this research is targeted towards IT experts, further studies will be conducted to understand the views of the business in respect to the challenges and benefits of the ITIL implementation. A comparison of views, the IT and the business view, on these topics is relevant. As well, studies will be conducted to understand how Business-IT alignment is affected by the implementation of ITIL. This could be done by conducting a survey and using a proven method of measuring Business-IT alignment and measuring ITIL maturity.

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