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Systematic Approach to Successful Implementation of ITIL

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Abstract

Information Technology and Infrastructure Library implementation is not well spelled out in documentation and therefore can be very challenging. In this study, a literature review is conducted to identify critical success factors (CSFs) for ITIL implementation. The CSFs are then used in an improved solution to the decision problem using Analytical Hierarchy Process. In order to validate the proposed model, it was applied to a case study of a company in the United Arab Emirates, where the ITIL implementation project failed.

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Keywords: Information Technology Infrastructure Library; ITIL; Critical Success Factors; Analytical Hierarchy Process; Systematic Approach

1. Introduction

Demand for a governance model or a quality improvement framework such as Six Sigma, Total Quality Management (TQM) or Business Process Reengineering (BPR) increases as managements begin to recognize the importance of Information Technology (IT) to the core business. However, most of the models are very limited in scope and are mainly designed for products not services. In order to address these limitations, researchers and governmental bodies introduced IT frameworks such as Capability Maturity Model Integration (CMMI), Information Technology and Infrastructure Library (ITIL) and Control Objectives for Information and related Technology (COBIT). Among these three IT governance models, ITIL proved best adherence to Information Technology Service Management (ITSM) [2], [7-9].

ITIL is a set of service management standard library that focuses on the IT industry. It was developed by the Central Computer and Telecommunications Agency (CCTA), which later merged with the Office of Government Commerce (OGC) of the UK government in the middle of 1980s. The latest version of ITIL enacted by the OGC is ITIL 3.0 [6]. Even though ITIL has been around for more than 20 years now and has

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gain significant popularity among IT practitioner, there has been little academic research published to date about issues related to ITIL adoption and implementation. Implementing ITIL has proven to be challenging because it depends on various critical factors each of which might compromise the overall implementation of the project [3], [11-12], [15]. It was found that a large number of the CSFs are not technology-based, that is, they do not depend on the vendor or application selected to aid in ITIL implementation. On the contrary, most of the CSFs relate to user acceptance of the framework.

Therefore in this paper, we propose a set of CSFs that considers both human and technological factors. We then use these criteria in an improved solution to the decision problem using the well-developed Analytical Hierarchy Process. Since ITIL popularity has much to do with the fact that it is not based on academic view but purely on what has been proven to work effectively, we tested our proposed model at a financial firm in the United Arab Emirates (UAE). We surveyed fifteen experts who were directly involved in the ITIL project at the firm. The case study confirmed our main objective, which was to help the decision makers to better identify an appropriate practice for ITIL implementation using a systematic approach.

2. Literature Review

2.1 Information Technology Infrastructure Library (ITIL)

Information Technology Infrastructure Library **(**ITIL) is a framework of best practices compiled from the public and private sector organizations worldwide. The objective is to deliver high quality IT services, essentially for IT Service Management (ITSM) [6]. There are two major reasons that explained the move towards implementing ITIL. The first reason is the increased focus on customer service [3], [11-12], [14-15] and the second reason is the increased interest in effective and transparent IT governance [3].

ITIL has proved to provide many benefits such as cost savings, risk management and streamlining of IT operations [10], however it also faces several implementation challenges. ITIL is not well spelled out in documentations, and it provides only general guidance on what processes to implement. As such, many managers were in doubt about the best practice to implement ITIL [10] and often relied heavily on the consultants, and vendors. Another common challenge in ITIL implementation is the resistance it receives by staff due to poor change management [10]. In order to overcome, or at least reduce ITIL implementation limitations and setbacks, researchers studied CSFs and how users perceive IT frameworks.

2.2 Critical Success Factors for ITIL Implementation

ITIL has become a global standard of best practices in IT service, but many companies agreed that ITIL implementation was challenging and not all ITIL processes are of equal importance and value to them [3], [10]. It is therefore important for companies to understand the factors that would help to determine whether ITIL implementation would be successful. In this study, an extensive literature review was conducted to identify critical factors for successful implementation of ITIL.

The first paper reviewed was a meta-analysis of previous studies on critical success factors (CSF) [14]. In another paper, an ITIL expert, Marquis [10], provides a list of concise CSFs, and non-technical best practices for each ITIL implementation based on his experience about ITIL. Another paper identified CSFs that was based on results of a questionnaire completed by itSMF National Conference delegates [3]. Most of the papers reviewed were multi-case studies of organizations that have implemented ITIL where the authors interviewed ITIL stakeholders in the studied organizations [2], [7-8], [11-12], [16]. In Cater-steel [2], key success factors for ITIL implementation were derived by studying five Australian organizations that have successfully transformed their IT service management by implementing ITIL. In another paper, Iden and Langeland [7] studied the adoption of ITIL in the Nordic countries where they managed to get 446 responses from firms in the four Nordic countries. The final paper presented barriers instead of success factors to successfully implement

ITIL, hence, these factors were negated to their positive counterpoints in order for us to use them as CSFs in our paper [15]. In total, we identified 17 factors and their significance is briefly explained in Table 1.

Table 1. Identified CSF for successful ITIL implementation

Critical Success Factor	Significance
1. Management Support	• Endorses policy and enforces compliance to following newly implemented standard processes [16] • Guarantees funding needed for consultancy, tools, and training [12] • Triggers communication between stakeholders [14]
2. ITIL Awareness and Training	• Effective communication among stakeholders [14] • Knowledge of ITIL documentation is considered a quick win [8] • Reduces employee resistance [12] • Increases cooperation and adoption of new processes [14]
3. Interdepartmental Collaboration	• Maximizes knowledge sharing and communication [12], [14] • Makes modifying cross-functional process smoother, hence, minimizing the risk of project implementation from running overtime [4]
4. Process Priority	• Accurate process definition has priority over tool selection [12]
5. Tool Selection	• Avoids underutilized tools [12] • Allows easier configuration of the processes [12] • Influences Perceived Usefulness (PU) [14]
6. Change Management	• Critical in situations with big bang (revolutionary) [11], [15]
7. Customer Orientation	• Provides proactive IT process rather than firefighting [15]
8. Use of Consultants & Consultant selection	• Knowledge transfer to permanent staff is critical once implementation is completed [12]
9. Implementation Strategy and Design	• Provides proper applications of implementation strategies [11]
10. Project Champion	• Advocates and promotes ITIL [3]
11. Ability of IT staff to adapt to change	• Involving the staff in the ITIL implementation process from the beginning till the end is very crucial to help the staff adapt to the change [3]
12. Quality of IT staff allocated for ITIL	• If ITIL training positively impacts communication and collaboration on ITIL processes [14], it can be drawn that competent knowledge in ITIL is critical to smoother implementation
13. Monitoring and Evaluation of ITIL Implementation	• Ultimately affects Attitude towards Use (ATU) [14] • Essential for continuous improvement program that is a must for ITIL implementation [10]
14. Feasibility Study before the Actual Implementation	• Helps planning the implementation process [8]
15. Project Management and Continuous Service Improvement	• Analyzes business needs, involves stakeholders, establishes goals and manages processes of change [10]
16. Goal Setting Through Process Maturity Framework	• Helps companies know when and where to begin implementing ITIL [10] • Establishes an understanding of company's needs through maturity frameworks like CMMI or COBIT. [16]
17. Continuous Reporting and Auditing through a Quality Management Framework	• Ensures a step-by-step close eye analysis of the implementation process of ITIL [10]

The 17 CSFs are then grouped into 7 key classes of factors. The 7 key CSFs were originally proposed by [14] as the main CSF relevant to ITIL implementation after conducting a qualitative meta-analysis of available ITIL research. The 17 factors are then mapped to the seven key factors in order to have a comprehensive and detailed list of CSFs (see Table 2). Table 2 also summarizes the conducted comparison between ten most prominent research papers in terms of reported critical success factors.

Table 2. Identified CSF for successful ITIL implementation and classification of identified CSFs

			References									
	CSFs Key Classes	Identified Critical Success Factor	Paper [14]	Paper [12]	Paper [11]	Paper[3]	Paper [15]	Paper[7]	Paper [16]	Paper [2]	Paper [8]	Paper[10]
1	*Top management support*	*Management Support*	✓	✓	✓	✓		✓	✓	✓		
2	*Change management and organizational culture*	*Change Management*	✓	✓	✓		✓		✓			
		Ability of IT staff to adapt to change				✓						
3	*Monitoring and evaluation*	*Monitoring and evaluation of ITIL Implementation*	✓		✓							
4	*Communication and cooperation*	*Interdepartmental Collaboration*	✓	✓			✓					
		Realization plan						✓	✓	✓		
5	*Project management and governance*	*Project Management and Continuous Service Improvement Program*										✓
		Goal Setting through Process Maturity Framework										✓
		Project Champion	✓			✓			✓			
		Customer Orientation		✓	✓		✓	✓				
6	*Training and competence of involved stakeholder in ITIL project*	*Feasibility Study before the actual implementation*									✓	
		ITIL Training, Awareness and Knowledge management	✓	✓	✓	✓	✓	✓		✓		
		Quality of IT staff allocated for ITIL	✓			✓						
7	*ITIL process implementation and applied technology*	*Implementation Strategy and Design*	✓	✓	✓			✓	✓			
		Continuous Reporting & Auditing through a Quality Management Framework										✓
		Process Priority	✓	✓								
		Tool Selection	✓	✓					✓			
		Use of Consultants & Consultant selection		✓								

3. Framework Development Using Analytical Hierarchy Process

In order to systematically implement ITIL for a given organization, we apply a novel application of a traditional technique for multivariate decision-making called Analytical Hierarchy Process (AHP). We chose AHP because it is ideal for complex, multi-criteria problems where both qualitative and quantitative aspects of a problem can be incorporated [1]. In AHP, any given problem is structured in terms of a hierarchy (see Figure 1). AHP simplifies the decision-making process by breaking a complex problem into a series of structured steps. The hierarchy method used in AHP has various advantages. One of the most prominent is the ability to incorporate a group decisions. This approach is a powerful way to build consensus, as each member can see where he or she stand and compare their judgments to those of the group.

Objective	Level 1 Factor		Level 2 Factor	
Successful ITIL Implementation	F1	Top management support	F11	Management Support
	F2	Change management and organizational culture	F21	Change Management
			F22	Ability of IT staff to adapt to change
	F3	Monitoring and evaluation	F31	Monitoring and evaluation of ITIL Implementation
	F4	Communication and cooperation	F41	Interdepartmental Collaboration
			F42	Realization plan
	F5	Project management and governance	F51	Project Management and Continuous Service Improvement Program
			F52	Goal Setting through Process Maturity Framework
			F53	Project Champion
			F54	Customer Orientation
	F6	Training and competence of involved stakeholder in ITIL project	F61	Feasibility Study before the actual implementation
			F62	ITIL Training, Awareness and Knowledge management
			F63	Quality of IT staff allocated for ITIL
	F7	ITIL process implementation and applied technology	F71	Implementation Strategy and Design
			F72	Continuous Reporting & Auditing through a Quality Management Framework
			F73	Process Priority
			F74	Tool Selection
			F75	Use of Consultants & Consultant selection

Fig. 1. The Hierarchy representation of Critical Success Factors

4. Methodology

In order to test the framework defined in Figure 1, we interviewed and surveyed fifteen experts from a financial institution in the United Arab Emirates. The firm is fairly young; it was established about thirteen years ago. We chose this particular firm because it has the financial, and human resources necessary to manage a variety of activities; it has service management professionals within the company; and it has the ability to acquire differentiated knowledge about best practice adoption through various cooperative strategies with other organizations experienced in IT service management. At the time of first approaching the company, the firm had just finished its ITIL implementation. This situation provided an excellent opportunity to test our proposed model in an attempt to identify the factors that drive success of ITIL implementation and highlight the pitfalls, which could impede the adoption of ITIL framework.

4.1 Survey Sample

The participants were selected based on their job descriptions and their involvement in the ITIL implementation. In addition, the selection covered different categories of users at different organizational levels (see Table 3 for details). The survey questionnaires were e-mailed to the fifteen experts who had agreed to participate in judgmental exercises involved in the AHP. The experts were given two to three weeks to complete the survey. By the deadline, all fifteen experts have successfully completed and returned the survey. It is important to note that the results obtained from this convenience sample of subjects represent a broad cross section of experts' opinions (see Table 3) and can guide us about decision-making and perception towards ITIL implementation. All participants were promised anonymity and confidentiality of their participations; therefore

we will refer to the participants as IExpert1-5 for the IT team, EExpert1-5 for the end-users and MExpert1-5 for the upper level managers.

Table 3. Sample demographics

Experts	Title	Education Background	Years of employment at the firm
IExpert1	Software Developer	Bachelors	3 years
IExpert2	Software Developer	Bachelors	3 years
IExpert3	Senior Software Developer	Masters	6 years
IExpert4	Systems Engineer	Bachelors	5 years
IExpert5	Database Administrator	Bachelors	5 years
MExpert6	Chief Information officer	MBA	10 years
MExpert7	Director of Operations	Masters	13 years
MExpert8	Chief Finance Officer	MBA	13 years
MExpert9	Director of Trading and Clearing	MBA	13 years
MExpert10	Director of Marketing	MBA	12 years
EExpert11	Financial Consultant	Bachelors	3 years
EExpert12	Financial Consultant	Bachelors	3 years
EExpert13	Financial Consultant	Bachelors	2 years
EExpert14	Customer Service Support	Certificate	2 years
EExpert15	Business Analyst	Masters	2 years

5. Data Analysis

The fifteen experts evaluated the hierarchy of the CSFs (Figure 1) constructed by pair-wise comparison. Since the model consists of more than one level, hierarchical composition was used to weigh the eigenvectors by the weights of the criteria. The sum was taken over all weighted eigenvector entries corresponding to those in the lower level, and so on, resulting in a global priority vector for the lowest level of the hierarchy. The global priorities are essentially the result of distributing the weights of the hierarchy from one level to the next level below it.

The individual judgments from each expert were entered into the AHP software and results from each expert were combined and calculated for the entire group. AHP can be applied easily with groups. Each member's assessments are evaluated for priorities and inconsistency using their own hierarchy, and then the group rollup is synthesized and calculated by taking the geometric mean of the final outcomes of the individual judgments [13]. This approach provides an efficient way to build consensus since each expert can see where he or she stand and compare it to the group as a whole.

6.0 Results and Analysis

We calculated the overall priority for each of the criteria for each group and the result in terms of ranking for the first level is shown in Table 4. The result showed that the three groups of experts – the IT Staff, the Management team and the Users have different priorities in terms of the CSFs of ITIL implementation. Interestingly, we can see that both the IT Staff and the management team viewed top management support as the most important CSF while the Users viewed Communication and cooperation as the most important.

Another interesting result was the rank for the least important factor. The IT Staff viewed change management and organizational culture as the least important while the management team viewed ITIL process implementation and applied technology as the least important. The users on the other hand considered monitoring and evaluation as the least important to them.

Table 4. Survey Result

Criterion		Ranking		
		IT Staffs	Management	Users
F1	Top management support	1	1	4
F2	Change management and organizational culture	7	4	3
F3	Monitoring and evaluation	6	6	7
F4	Communication and cooperation	4	3	1
F5	Project management and governance	5	2	6
F6	Training and competence of involved stakeholder in ITIL project	2	5	2
F7	ITIL process implementation and applied technology	3	7	5

7. Discussion and Implications

In this paper, ITIL synthesized CSFs were identified from a comprehensive literature review and were applied to a case study of a company that suffered from implementing ITIL. It took the company five years to implement few selected processes of ITIL. According to the CIO of the firm, one of the reasons was the poor way the ITIL implementation was handled as the company does not have any project management strategies nor follows any project management methodologies.

The IT Staffs agreed that there was no proper project management involved in the ITIL implementation. The absence of project management highly contributes to the failure of projects. In addition, the management neither communicated nor chased feedback from employees throughout the implementation process of ITIL. Finally, the management did not account for the stable organizational culture and attempted to implement ITIL as part of the business not as a project. This resulted in the employees looking at it as an extra workload. Therefore, handling ITIL as a project may help the employees realize the benefits.

The IT Staffs added that training was not made mandatory by the management. In addition, the goals of the training were not communicated properly resulting in many employees not taking it seriously. The company did not spend enough effort in understanding its culture and did not implement the right methodology for tool and vendor selection, which resulted in a one-year delay trying to customize the tool.

According to the end users, most of the employees' were not very interested in the ITIL implementation. This was due to the fact that the top management did not communicate the need for ITIL to the employees nor did it ask for the employees' feedback during the process. Consequently, the employees did not feel the urge to commit to the project. It is worth noting that the employees started changing their behaviour towards adopting ITIL in their relevant tasks only after the management started questioning them on their lack of adhering to the new processes.

The IT Staffs mentioned that although management had approved the purchasing of an ITIL compliant tool, hired a consultant to guide the implementation process and provided the required training for the employees, the acceptance of ITIL was not as high as it was expected to be according to the adoption model. The reason behind that was the absence of other critical factors such as change management procedures, project management methodologies and effective communication.

7.1 The Use of AHP-based Evaluation Model

The use of formal evaluation process such as the AHP-based evaluation model in understanding the needs of every stakeholder had never been done at the firm before. Even though the proposed AHP-based evaluation

model provides a selected set of criteria, it is flexible enough to adapt to different cases to suit a specific project or needs.

The end-users found this method to be especially helpful. Prior to this study, they were not involved in any decisions even though they were the ones who usually got affected the most. They were usually not aware of whether or not licenses were to be renewed or software was to be upgraded or changed. According to one of the users, they were left out in the implementation process because most of them do not have technical background. However, in this study they found it very easy for them to get involved regardless of their lack of technical background. The AHP-based evaluation method used in this study is very systematic and easy to use.

The IT team found that the AHP-based evaluation process gave them better understanding of the impact of their priorities. The AHP method enables them to structure a decision making problem into a simple hierarchy, helping them to understand and simplify the problem. Most importantly the AHP-based evaluation model work well in order to understand the different priorities of CSFs as perceived by others. The different importance of the priorities could eventually affect the success of ITIL implementation. The Management team valued the fact that the model can balance the different opinion of all the users in order to have the final ranking of variable that best fit their opinions.

In conclusion, organization need to approach ITIL initiatives with a clear understanding of how the organization operates because ITIL implementation requires more skills than just ITIL knowledge. It involves every group and individual in the organization and requires cultural change.

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