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ITIL Adoption Model based on TAM

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***Abstract*—although Information technology infrastructure library (ITIL) is the most popular framework for IT service management all around the world, problems for organizations in the process of adoption would eliminate its benefits. In fact the ability of organization to adopt this framework is the basis for IT service improvement. Few studies have tried to find out success factor that influence ITIL adoption but no study was found investigating an adoption model for this framework. In this study, first seven success factors were identified through qualitative meta-Synthesis relying on previous studies; then, a research model based on the technology acceptance model (TAM) for representing the influence of these critical success factors on ITIL adoption is proposed. The success factor used are: (1) top management support, (2) communication and cooperation, (3) training and competence of involved stakeholder in ITIL project, (4) change management and organizational culture, (5) project management and governance, (6) ITIL process implementation and applied technology, (7) monitoring and evaluation.**

Keywords- Information Technology Infrastructure Library; ITIL; ITSM; ITIL adoption; TAM.

I. INTRODUCTION

In the past years IT functions have been driven by a convergence of circumstances to become more service-oriented so that they can be better aligned with the business objectives of their organizations [1]. The IT service management (ITSM) model represents a paradigm shift for IT functions to focus on the provision of quality end-to-end IT services [2].

One of ITSM framework that is most accepted and popular in the world is Information Technology Infrastructure Library (ITIL) [3 4]. The ITIL best practice framework is one solution for better IT governance and more efficient IT functions. To date 50000 IT professionals have ITIL certification and 24.1% of IT managers are familiar with ITIL in large organizations [5].ITIL provides standard practices for planning and executing an ITSM program to improve quality, reduce cost, and mitigate risk [6]. There are strong indications that implementing ITIL by following the system-thinking approach may add and sustain competitive advantage [6]. Whether it is the internal IT organization or the external service provider, each organization should adopt the guidelines, principles, and concepts of ITIL and adapt them to suit their organization context [7]. Increasingly, IT organizations are adopting this framework to improve IT environments and for meeting today's business challenges [8]. Given the attractiveness of the ITIL advantages such as increased productivity, increased efficiency, and reduced downtime, more and more organizations across the world have embraced and implemented ITIL (such as IBM, HP, P&G, Microsoft and HSBC) [9]. It may take years to full adoption of ITIL, and involvement of managers and personnel is required. Particularly, IT operation managers must be aware of the influential factors on successful ITIL adoption [4]. Although ITIL is becoming essential in IT operation, many organizations have problems during implementation, so that the definite need for empirical research is recognized [4]. As cited in [10] Holland and Light asserts that organizations often must perform relevant organizational changes, which can cause negative impacts on structures, processes and cultures. Usually, these changes generate feelings of demotivation and disinterestedness in the users towards the new tool [10]. For that reason, the success or failure of ITIL implementation directly depends on the users' behavioral intention to use. Some studies were focused on the critical success factors (CSFs) from organizational or personal views. Some researchers studied the influence of perceived usefulness (PU) and perceived ease of use (PEU) on attitude toward use (ATU) and symbolic adoption (SA) based on the theory of technology acceptance model (TAM) [11]. But any study does not put them together to represent the influence of CSFs on PU, PEU, ATU and finally on Actual system use.

In this paper, first the ITIL framework is explained; qualitative meta-synthesis research method applied for extracting success factors influence ITIL adoption is described; then Technology Acceptance Model (TAM) and success factors as our research framework are accounted for; finally, ITIL adoption model is represented.

II. THE INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY

ITIL is a public framework that describes Best Practices in IT service management and provides a framework for the governance of IT, and focuses on the continual measurement and improvement quality of IT service delivered, from both a business and a customer perspective [12]. It is a de facto standard that is a synthesis of ideas drawn from international practitioners.

ITIL V1 was developed in 1980s by Central computer and Telecommunication Agency (CCTA), now called Office of Government Commerce (OGC) in the United Kingdom and used by government agencies to promote efficient IT operations. Version 2 of ITIL was released in year 2000. The core of ITIL V2 is IT service and two components of this version are service delivery and service support. Last version of ITIL, ITIL V3 was published in mid-2007 which adopted more of a lifecycle approach to service management, with greater emphasis on IT business integration [13]. ITIL V3 has five core volumes as shows in figure 1[14]:

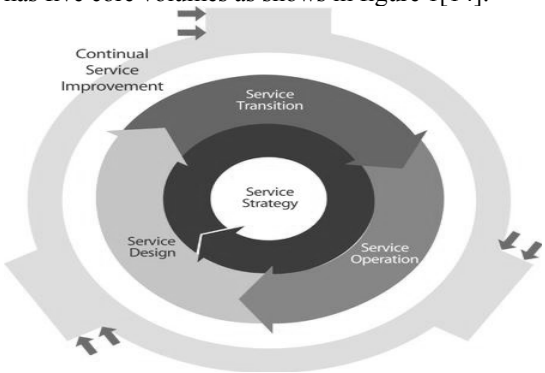

Figure 1. Overview of ITIL V3

Service strategy: The Service Strategy publication provides guidance on how to design, develop and implement Service Management, not only as an organizational capability but also as a strategic asset. It is provided on the principles underpinning the practice of Service Management, which are useful for developing Service Management policies, guidelines and processes across the ITIL Service Lifecycle [14].

Service design: This publication provides guidance for the design and development of services and Service Management processes. It covers design principles and methods for converting strategic objectives into portfolios of services and service assets [15].

Service transition: This publication provides guidance for the development and improvement of capabilities for transitioning new and changed services into operations. This publication provides guidance on how the requirements of Service Strategy encoded in Service Design are effectively realized in service operations while controlling the risks of failure and disruption [16].

Service operation: The service operation publication embodies practices in the management of service operations. It includes guidance on achieving effectiveness and efficiency in the delivery and support of services so as to ensure value for the customer and the service provider [17].

Continual Service Improvement: This publication guidance in creating and maintaining value for customers through better design, transition and operation of services. It combines principles, practices and methods from quality management, Change Management and capability improvement [14].

III. RESEARCH METHOD : QUALITATIVE META SYNTHESIS

"Meta-synthesis is a technique that can help establish qualitative research as a viable source of evidence. Using this approach, results from multiple qualitative research studies on the same topic are combined and synthesized to reveal the best evidence"[18]. Referred to [19], Efforts to synthesize existing qualitative research studies are seen as essential to reaching higher analytic goals as well as enhancing the generality of qualitative research. To accomplish this goal meta-synthesis encompasses seven steps: (1) Formulating a research question, (2) Conducting a systematic literature search, (3) screening and selecting appropriate research articles, (4) extract article information, (5) Analyzing and synthesizing finding, (6) Maintaining quality control, and (7) Presenting finding [20].

In this paper, qualitative meta-synthesis was conducted to extract factors influencing ITIL adoption in organizations based on eight primary qualitative studies that are similar or regarding research question. First, the research question was formulated: which factors influence ITIL adoption in organizations? Next, articles and studies were selected from different data bases to take systematic review. Then based on extracted information and knowledge from chosen references, findings were analyzed and synthesized. In this research, TAM was used as our basic model to investigate the factors affect ITIL adoption in organizations. A wide number of papers that use TAM to explain the IS acceptance has been identified [10]. For presenting the impact of these CSFs on IT staff acceptance of ITIL implementation, it's necessary to understand the relationship between CSFs and TAM.

IV. RESEARCH CONTEXT

A. Technology Acceptance Model

In this study, TAM was put forward as fundamental model. TAM was proposed by Davis [22] and Davis et al. [23] to address why users accept or reject information technology. Their model is an adaptation of the theory of reasoned action (TRA), proposed by [24] to explain and predict the behaviors of people in a specific situation [25]. A key purpose of TAM is to afford a basis for following the impact of external variables, on internal beliefs, attitudes, and intentions which they provide a better understanding of what influences PU and PEU [25].

PU is ''the degree to which a person believes that using a particular system would enhance his or her job performance", and PEU is ''the degree to which a person believes that using a particular system would be free of effort" [22]. Referred to [10] their study and other studies on technology acceptance show how PEU directly influences PU and ATU [23], and also, [22] shows that PEU is the preceding of PU because,

through PU, PEU indirectly influences ATU and BIU. In addition to, PEU does not directly influence acceptance, but Davis [22] believes that through the medium of ATU, there is in an indirect relationship [10].

B. Critcal success factors for ITIL adoption

"Critical success factor (CSF) is the term for an element that is necessary for an organization or project to achieve its mission. It is a critical factor or activity required for ensuring the success of an organization or a company"[21].According to this definition, our purpose is to define the groups of CSFs for ITIL adoption. Preliminary evidence on CSFs in ITIL implementations was found in only eight studies. Their results are based on different methods, and generally, questions related to success factor were only among various themes in these studies [4]. Through meta-synthesis research, seven factors are identified. These factors and their relationships between each other as well as their effect on TAM variables are discussed:

a) Top management support

Top management support has been recognized as one of the most important elements in the successful implementation of an IS/IT project [28]. A lack of senior management support and engagement by the project team could have created a 'them and us' atmosphere in which resistance to new service processes built up [31]. The ITIL project must receive approval and support from top management before it can be implemented. Support from top management is necessary to guarantee funding for resources such as training, hardware and software. It is essential to approve policy and enforce compliance to the standard process across whole organization [3]. This becomes reality through the development of communication. Top management usually controls the communication activities [10].

b) Communication and cooperation

As cited in [28], Motwani, et.al and Sarker and Lee assert that in order to avoid failures in communication, an open and honest information policy communicated to the users can satisfy their need for information. Effective coordination of multiple vendors is critical to success of the implementation [2]. Training and staff awareness across various departments encourage interdepartmental communication and collaboration [3]. Communication increases cooperation [10], communication as the main activity to realize ITIL adoption expectations and to decrease its implementation problems is considered by organizations. Regarding to this reasoning, it is possible to discern how communication and cooperation is related to PU.

c) Training and competence of involved stakeholders in ITIL project:

All employees are involved require general training in core topics appropriate for personnel to understand what ITIL means, and for personnel to be able to talk and work together with various ITIL processes [4]. In some organizations, external consultants were engaged. Knowledge of having worked in different environments was provided by external consultants. They are aware of various implementation related issues [29]. Training allows users to interact with the ITIL. Training allows the sharing of common problems and increase communication and cooperation in ITIL; it means this factor has an impact on communication and cooperation. The relevance of training and PEU and further more ATU is proposed. Training will help users understand how using ITIL framework could impact their jobs, consequently influence their PEU of an ITIL framework.

d) Change management and organizational culture:

Adoption of any IT service management or IT Governance frameworks like ITIL is a challenge in itself. It is not just about technology change, it is about the whole organizational culture acceptance [29]. Understanding the context of change would be instrumental in showing staff how their interests aligned with the interests of ITIL [31]. Referred to [30] an ITIL-introduction will not be effective not before handling the cultural aspects. One of the critical elements involved in any program to manage change is training and education [28], therefore training and competence of involved stakeholders influence change management. As cited in [11] Elizur and Guttman argue that users' involvement in the design of new information system may improve their attitude toward change. As this result, change management influence PU and PEU.

e) Project managemant and governance:

There is no doubt that project management is necessary for implementing any kind of project [28]. Excellent project management against a project plan with clear objectives, deliverables, and milestones ensures that the project is effectively planned and delivered [28]. The studies in IT projects indicate that project champion should be a senior manager, someone who is able to negotiate for the required resources to move an idea to accomplishment and who understands the underlying technology and also the business and organizational context [2], hence top management has effect on project management. Through showing "quick wins", usefulness of service-oriented IT management is demonstrated [27], therefore Project management and governance influence PU. Project management facilitates implementation of ITIL process, so that it has an impact on ITIL process implementation and applied technology. Also communication that realized as one of CSF in this study for ITIL adoption is one of main module of project management.

f) ITIL processes implementation and applied technology:

OGC (2000) recommends an initial analysis of the processes and procedure before the implementation of ITIL is initiated which allows the project managers to identify the gaps and focus on the main objective of implementation rather than just implementing for change [29]. There are no hard and fast rules with regard to what process an organization should implement. It is dependent on the requirement of the organization, but the processes that are critical for obtaining objectives and require improvement should be given priority [29], thus this CSF is affected by project management and governance. A modular ITSM

system is needed and must be applied for all process, for this reason this CSF influence PEU.

g) Monitoring and evaluation:

There is a recognizable change from technology-focus to customer-centric metrics that need to be recorded and reported. It means type of metrics to report that are meaningful to the customers rather than on IT technology and application performance [3]. Through monitoring and feedback from the IT staffs, the performance of implementing ITIL framework can be reviewed and evaluated to see whether it is achieving business goals and objectives and ultimately, it has effect on ATU. Undoubtedly, top management support and project management influence this CSF.

V. PRPOPOSED MODEL FOR ITIL ADOPTION

Based on previous section and as we described the relation between CSFs and TAM variables and also the logic connection between CFSs; our proposed model is displayed in Figure 2. We suggest all organizations which plan to adopt ITIL framework to improve their IT service, consider depicted model in this article to make sure that all factors affect IT staff acceptance have been studied.

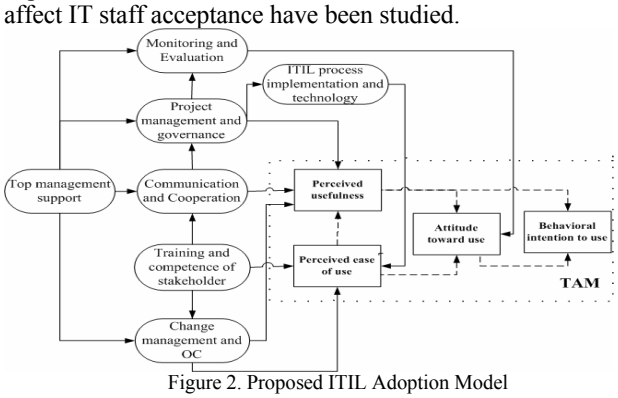

Figure 2. Proposed ITIL Adoption Model

VI. CONCLUSION

Although ITIL is developing as the most commonly used reference for many IT organizations considering or actively adopting a service management strategy, academic research related to adoption of this framework is scarce despite the obvious challenges associated with its adoption and implementation [1 2 3 4 29]. While many organizations in different countries are now adopting ITIL framework, there has not been much research on the success and failure of its adoption on IT staffs' acceptance in these companies. In the same way, few studies in ITIL adoption and implementation have survey on CSFs without investigating the relationships between these factors, and ultimately, their influences on PEU and PU. Qualitative Meta-synthesis research method was conducted to identify seven success factors for ITIL adoption, and then according to TAM, influences of these success factors on this accepted model and also the relationship between the seven success factors are surveyed.

As is shown in the model, top management support as a key factor for implementing ITIL in organization has impact on communication and cooperation, change project management and governance, monitoring and evaluation, and also change management and organizational culture, as well as indirectly influence on IT staffs' acceptance. Communication and Cooperation is affected by training and competence of involved stakeholders and also top management support, and has impact on PU. Training and competence of involved stakeholders influence change management and organizational culture and has impact on PEU. Change management and organizational culture is affected by top management support, and influence on PEU and PU. Project management and governance is affected by Communication and Cooperation, has impact on ITIL process implementation and applied technology and also monitoring and evaluation and influence PU. Monitoring and evaluation has an impact on ATU. The relationships between PEU, PU, ATU and BIU are proved in many studies and are used as given relations in this research.

Main goal of this study was to build a framework to understand adoption of ITIL and depict the relationship between major ITIL CSFs on TAM. For further research, testing and validating of this model in various organizations which implemented ITIL is suggested.

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REFERENCES

[1] W. Tan, A. Cater-Steel, M. Toleman, and R. Seaniger, ″Implementing centralised IT Service Management: Drawing Lessons from the Public Sector." Paper presented at the Australasian Conference on Information Systems, Toowoomba, Dec 2006

[2] W. Tan, A. Cater-Steel, and M. Toleman, " Implementing IT service management : a case study focusing on critical success factors." Journal of Computer Information systems, vol 50(2),Feb 2009, pp 1-12.

[3] C. Pollard, A. Cater-Steel, "Justifications, Strategies, and Critical Success Factors in Successful ITIL Implementations in U.S. and Australian Companies: An Exploratory Study. ″ Information Systems Management,vol 26 (2), 2009, pp 164–175

[4] J. Iden, L. Langeland, "Setting the stage for a successful ITIL adoption: A Delphi study of IT experts in the Norwegian Armed Forces.", Information systems management ,vol 27(2) , 2010, pp 103-112

[5] J B. McNaughton, P. Ray, and L. Lewis, " Designing an evaluation framework for IT service management." Information & Management , vol 47,2010,pp 219–225

[6] S.M. Mirghani, M.R. Vincent, J.O. Kevin, and M. Mona," The re-structuring information technology infarstucture library (ITIL) implementation using knowledge management framework", the journal of information and konwledge mangement systems,vol 38(3), 2008, pp 315-333, DOI 10.1108/03055720810904835

[7] N. Kumbakara, " Managed IT Services: the role of IT Standards", Information Management & Computer Security, vol 16(4), 2008, pp 336-359, DOI 10.1108/09685220810908778

[8] Techrepublic, "The adoption of ITIL in large organizations." Retrieved retrieved August 28 ,2010 from http://www.techrepublic.com ,Jan 2005

[9] S. S.C. Shang, S-F. Lin, " Barriers to implementing ITIL-A-Case study on the service-based industry", Contemporary Management Research, vol 6(1), 2010, pp 53-70

[10] S. Bouno, J.L. Slermon ," TAM-based succesful ERP adoption", Interacting With Computers, vol 20, 2008, pp 515-523

[11] Y. Song, J.Han, D.Cheng, Y. Zhang, " An emperical research on the impact of CSFs on adoption of ERP",

[12] OGC , "An introductory interview of ITIL v3" , 2007 , retrieved 31 auguast 2010 form http://www.best-management-practice.com/gempdf/itSMF_An_Introductory_Overview_of_ITIL_V3.pdf

[13] OGC , Office of Government Commerce, retrieved August 31, 2010 ,from http://www.best-management-practice.com/gempdf/ITIL_The_Basics.pdf

[14] Sharon Taylor, M. Iqbal, and M. Nieves, "ITIL: Service Strategy" ,TSO publications Norwith, UK, 2007

[15] Sharon Taylor, V. Lioyd, and C. Rudd, "ITIL: Service Design" ,TSO publications Norwith, UK, 2007

[16] Sharon Taylor, S. Lacy, and I.Macfarlane, "ITIL: Service Transition" ,TSO publications.Norwith,UK,2007

[17] Sharon Taylor, D. Cannon, and D. Wheeldon, "ITIL:Service Operation" ,TSO publications.Norwith,UK,2007

[18] C.T.Beck, "Metasynthesis: A goldmine for evidance-based practice", Aorn Journal , vol 90(5) , 2009 , pp 701-710

[19] M. Sandelowski, S. Docherty,and C. Emden, "Focus on qualitative methods. Qualitative metasynthesis: Issues and techniques."Research in Nursing & Health, vol *20*(4),1997, pp 365-371.

[20] M. Sandelowski, J. Barroso, "Toward a metasynthesis of qualitative findings on motherhood in HIV-positive women." Research in Nursing & Health*, vol 26*(2),2003,pp 153-170.

[21] J.F. Rockart, "Chief executives define their own data needs." Harvard Business Review ,vol 57(2), 1979, pp 81–93

[22] F.D.Davis, " Perceived usefulness, perceived ease of use, and user acceptance of information technologies", MIS Quarterly, 13 (3), 1989, pp. 319–340.

[23] F.D. Davis, R. Bagozzi, P.R. Warshaw," User acceptance of computer technology: a comparison of two theoretical, models", Management Science, 35 (8), 1989, pp. 982–1003.

[24] M. Fishbein, I. Ajzen, "Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research", aditions-Wesly Reading, MA, 1975.

[25] P. Legris, J. Ingham, P. Collerette, "A critical review of technology acceptance model", information & management, vol 40, 2003, pp 191-204.

[26] K.Pederson, P.Kræmmergaard, B.C. Lynge, and C.Dalby Schou,"ITIL implementation: Critical Success Factor a comparative case study",Journal of Information Technology Case and Application Research, vol 12(2) , 2010, pp 11-35

[27] A. Hochstein, G. Tamm, and W. Brenner, "Service-Oriented IT Management: Benefit, Cost and Success Factors", Paper presented at the Fifteenth European Conference on Information Systems , Regensburg, Germany, June 2005

[28] E.W.T. Ngai, C.C.H. Law,and F.K.T. Wat, "Examing Crtitical Success Factor in adoption of Enterprise Resource Planning", Computers in Industry, vol 59, 2008, pp 548-564

[29] Sandeep Kaur Grewal, "Issues in IT Governance & IT Service Management -A Study of their adoption in Australian Universities", Master of Applied Science in Information & Technological Sciences at the University of Canberra-ACT, January 2006

[30] J. Iden, "Implementing IT Service Management. Lessons from a University IT Department. In A. Cater-Steel (Ed.), Information Technology Governance and Service Management*:* Frameworks and Adaptations. Hershey, PA: IGI Global , 2009

[31] A. Cater-Steel, N. McBride," IT Service Management Improvement — an Actor Network Perspective",proceeding of the European Conference on Information, Systems, St Gallen, Switzerland, 2007