

Investigating Role of Service Knowledge Management System in Integration of ITIL V3 and EA

Akbar Nabiollahi, Rose Alinda Alias, Shamsul Sahibuddin

Faculty of Computer Science and Information System
Universiti Teknologi Malaysia(UTM)
81310, UTM Skudai
Johor, MALAYSIA
nabi_ir@yahoo.com, rose@utm.my, shamsul@utm.my

ABSTRACT

Service Knowledge Management System (SKMS) is introduced by ITIL V3 as a set of tools and databases that are used to manage knowledge and information of IT services. The SKMS stores, retrieves, updates, and presents all information that is expected for management of whole lifecycle of IT Services. Regard to primary goal of the research, to provide a comprehensive integrated framework to identify and address IT Service Architecture requirements and issues in ITIL V3 using Enterprise Architecture, investigating ITIL Knowledge Management process and proposed model for SKMS have shown that architectures of IT services can be stored and retrieved by SKMS. In other word, SKMS as a set of tools and databases can be used for management of architecture components of target framework.

Keywords

IT Service Management (ITSM), ITIL, Knowledge Management, Service Knowledge Management System (SKMS), Enterprise Architecture (EA), Service Design (SD), Service Oriented Architecture (SOA)

1.0 INTRODUCTION

Services constitute more than 75 percent of industrialized nations' economies. These services are dependent on ICT that is supported by local and global information technology functions or the combination of both. IT services have helped deliver tools and process change to every part of the organization for decades. Yet, IT services have existed for many years with little internal standardization or process definition. Based on this requirement, IT service management (ITSM) was established based on modern international standards such as ISO/IEC 20000 and ITIL. There is a need for research that investigates the economic and social outcomes of ITSM as it relates to globalization of IT services and workforce (Galup, Dattero et al. 2007).

ITIL is an important and influential center of gravity in IT management (T.Betz 2007). Although ITIL V2 has been

applied in over 10 years, it was only focused on Service Delivery and Service Support and IT providers realized that there is a lack in strategy and design of service in practice. In 2007, OGC has released ITIL V3 to cover whole lifecycle of service which included five volumes as five stages of service: Service strategy, Service Design, Service Transition, Service operation and Continual Service Improvement (OGC 2007). These publications only provide general guidelines on IT Service Management, thus each volume should be adapted and designed in details to be used in practice.

Knowledge Management was added as a new process in ITIL V3. Some aspects of Knowledge Management were covered by various processes in ITIL V2. ITIL V3 defines Knowledge Management as the one central process responsible for providing knowledge to all other IT Service Management processes. Within IT Service Management, Knowledge Management and Service Knowledge Management System (SKMS) are concerned with service knowledge. Underpinning this knowledge will be a considerable quantity of data, which will be held in a central logical repository or Configuration Management System (CMS) and Configuration Management Database (CMDB) (OGC-V3-ST 2007).

Service Design(SD) phase, as second phase of IT Service lifecycle in ITIL V3, all aspects of service design including: new or changed service solutions, service management systems and tools, technology architectures and management, systems processes, roles and capabilities, measurement methods and metrics should be considered(OGC-V3-SD 2007). One of these aspects is technology architecture of service which could be considered as the requirements of service architecture. Service architecture attempts to integrate all information related to service. This information must involve applications, information, data and infrastructures for any IT service. These architectures are called Enterprise Architecture (OGC-V3-SD 2007).

Enterprise Architecture usually modeled as four architecture layers including business architecture, information architecture, application architecture and infrastructure architecture (Goikoetxea 2007; Winter and Fischer 2007) but not included service layer.

2.0 SERVICE KNOWLEDGE MANAGEMENT

As mentioned above, the lifecycle of service in ITIL is represented by five stages, namely, Service strategy, Service Design, Service Transition, Service operation and Continual Service Improvement. Knowledge Management process is introduced through Service Transition volume of ITIL V3. The goal of Knowledge Management process in ITIL V3 is to enable organizations to improve the quality of management decision making by ensuring that reliable and secure information and data is available throughout the service lifecycle (OGC-V3-ST 2007).

Knowledge Management is especially significant within Service Lifecycle since relevant and appropriate knowledge is one of the key service elements being used. During the service lifecycle an organization needs to focus on retrieving, sharing and utilizing their knowledge through problem solving, dynamic learning, strategic planning and decision making. To achieve this, knowledge needs to be transferred to other parts of the organization at specific points in the lifecycle. Effective Knowledge Management is a powerful asset for people in all roles across all stages of the service lifecycle. It is an excellent method for individuals and teams to share data, information and knowledge about all facets of an IT service. The creation of a single system for Knowledge Management is recommended (OGC-V3-ST 2007).

KMS is an IT system which is used to support and to strengthen the process of knowledge creation, access, transfer and usage. Knowledge management regards knowledge sharing as the core objective. Only through exchanges, can develop knowledge; only through the using of knowledge, can new knowledge be derived from the existed knowledge(Deng and Hu 2007). As figure 1 illustrated, within IT Service Management, Knowledge Management could be formed within the Service Knowledge Management System (SKMS). Underpinning this knowledge will be a considerable quantity of data, which will be held in a central logical repository or Configuration Management System (CMS) and Configuration Management Database (CMDB).

3.0 RESEARCH MOTIVATIONS

The authors have found that there is some vagueness on how to use EA in ITIL in an efficient and effective way to satisfy IT service requirement. In other words, one of primary questions of this research is raised as:

Research question: “How to fulfill architectural requirements of IT Services by using Enterprise Architecture in an efficient and effective manner in order to meet ITIL Service Design objectives?”

Today service is a general concept in many academic and practical disciplines. Each domain defines service in one

way. It seems that these different definitions and applications of service term might cause some confuse in academia and practice. For instance, both SOA and ITSM are Service based but SOA usually is used in application development domain while ITSM recommends a service based management system. It seems variety of service could cause some ambiguity in Service Sciences. As a suggestion by a researchers, Service could be considered as gravity center for Service Oriented Architecture, IT Service Management and recently Service Oriented Enterprise Architecture(R. Morrison 2008) but it needs to be conceptualized or redefined. In other words, to convergence these various frameworks and standards, a service-oriented integrated framework is required.

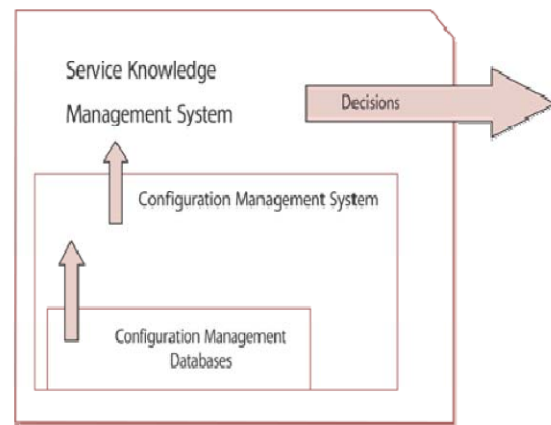


Figure 1: Relationship of CMDB, CMS and SKMS(OGC-V3-ST 2007)

Demirkan J.Kauffman et al. in paper titled 'Service-Oriented technology and management: Perspectives on research and practice for the coming decade' have discussed on different aspects of service-oriented disciplines and have finally concluded that one of major challenges and issues of service sciences and industries that should be taken up by researchers and universities is the integration of technological and social science, management and policy research based on service(Demirkan, J.Kauffman et al. 2008). They also encouraged computer science, IS and management researchers to respond to conduct and develop multi disciplinary research efforts to begin to address that issue. Moreover, they recommended various research paradigms and methods can be leveraged to investigate the challenging managerial and technical problems in service-oriented systems. Furthermore, they notified new researchers can use quantitative, qualitative and experiment methods, case and field studies, and design science approaches (Demirkan, J.Kauffman et al. 2008).

Literature review, experiences of the authors and this demand have led them to the second question of study:

Research question 2: “How to converge IT service standards and frameworks through service-oriented integration of ITSM, EA and SOA to provide a common discipline and framework for service in research domains of computing, information systems and IS/IT management?”

4.0 RESEARCH QUESTIONS AND OBJECTIVES

The background of the research has shown that an integrated framework for ITIL and EA is required to overcome the gap realized and mentioned above. This framework also attempts to design IT service architecture by using Enterprise Architecture based on ITIL V3 requirements. The research questions of main research are defined as following:

- ❖ RQ1: How to improve quality issues of IT/IS delivery through implementation of ITSM/ITIL and EA?
 - What are common issues in ITSM/ITIL and EA?
 - What is the relationship of ITSM/ITIL and EA?
 - How ITSM/ITIL and EA participate to improve quality of IT/IS Delivery?
 - What is the integration point of ITSM/ITIL and EA?
- ❖ RQ2: How to fulfill architectural requirements of ITSM/ITIL by using Enterprise Architecture?
 - How to define supportive architectures for IT service?
 - How to design relationship of service architecture and EA?
 - How to develop IT service architecture through EA?
- ❖ RQ3: How to converge ITSM/ITIL, EA and SOA disciplines through development of a service-oriented integrated framework?
 - What are the strengths of Enterprise Architecture Frameworks to satisfy architectural requirements of IT Service in ITIL?
 - How can researcher customize or develop a new framework to cover all architectural requirements of IT Service based on ITIL V3?
 - How can new framework be used for integration of EA, ITSM/ITIL and SOA?

The goal of this research is to develop a comprehensive integrated framework to identify and address IT Service Architecture requirements and issues through using Enterprise Architecture.

The research objectives that are defined based on this goal, research topic, problem statement and research questions are following:

- To define the roles of ITSM/ITIL and EA in IS/IT service delivery
- To identify architectural issues of IT Service Management.

- To design IT Service Architecture for ITSM and ITIL.
- To develop a framework for integration of ITSM/ITIL and EA.

It should be noticed that the primary focus of this research is ITSM/ITIL in order to identify and design issues and requirements of IT service architecture and finally to develop a service-oriented integrated framework.

5.0 SIGNIFICANT OF RESEARCH

This research attempts to contribute with practical efforts by developing an integrated framework in order to provide efficient and effective service architecture for ITSM and specially ITIL V3. This framework will help IT consumers and IT providers to implement ITSM specially ITIL along with Enterprise architecture.

In particular, in implementing ITIL V3, each organization should design all IT services based on Service Design guidelines. Proposed integrated framework will act as a well-defined architecture on IT services because it models how to use Enterprise Architecture as a baseline for IT Service Architecture. Therefore the proposed framework attempts to fill the gap of bridging ITIL to EA in practice and academic. Also it will propose an efficient and effective architecture for IT Service Management.

Moreover, this integrated framework will contribute in academic discipline to provide a common knowledge and framework on IT Services in different domains. Furthermore, the proposed framework aims to convergence some domain of service sciences such as SOA, ITSM/ITIL and EA.

Besides those, this new framework will facilitate to extend service architecture layer into Enterprise Architecture layers which is one of recent issues in using SOA in EA discipline. Even new target framework attempts to apply SOA in IT Service Design to expand SOA scope from application development to IT Service design and development.

6.0 ANALYSING ROLE OF SKMS

As mentioned in section two, ITIL defines its Service Knowledge Management System (SKMS) as following: “A set of tools and databases that are used to manage knowledge and information. The SKMS includes System Configuration Management System, as well as other tools and databases. The SKMS stores, manages, updates, and presents all information that an IT Service provider needs to manage the full Lifecycle of IT Services.” (OGC-V3-ST 2007)

In order to make effective use of data, in terms of delivering the required knowledge, an information architecture matched to the organizational situation and

the knowledge requirements is essential(OGC-V3-ST 2007):

- Creating and regularly updating a Service Management information model
- Defining systems that optimize the use of the information while maintaining data and information integrity
- Adopting data classification schemes that are in use across the organization

When the requirements and architecture have been set up, data and information management to support Knowledge Management can be established. The key steps required involve setting up mechanisms to(OGC-V3-ST 2007):

- Identify the service lifecycle data and information to be collected
- Define the procedure required to maintain the data and information and make it available to those requiring it
- Store and retrieve
- Establish authority and responsibility for all required items of information
- Define and publicize rights, obligations and commitments regarding the retention of, transmission of and access to information and data items based on applicable requirements and protecting its security, integrity and consistency
- Identify the requirements to review, in the light of changing technology, organizational requirements, evolving policy and legislation
- Deal with collection and retention requirements.

A service provider must first establish a service knowledge management system that can be shared, updated and used by its operating entities, partners, and customers. Implementation of a service knowledge management system helps reduce the costs of maintaining and managing the services, both by increasing the efficiency of operational management procedures and by reducing the risks that arise from the lack of proper mechanisms.

Related literatures grouped the models of KMS into four types, which are knowledge type model, process management model, hierarchical model and knowledge chain model. A hierarchical service model can represent KMS architecture. From the perspective of service model, the framework of KMS can be divided into four levels or four layers. They are knowledge units, knowledge processing, knowledge storage, and knowledge sharing(Deng and Hu 2007). ITIL suggests a four layer hierarchical model for SKMS including presentation layer, knowledge processing layer, Information integration layer and data and information sources and tools. This model is shown in figure 2.

In ITIL V3, asset is defined as ‘Any Resource or Capability’. Assets of a service provider including following types: Management, Organization, Process, Knowledge, People, Information, Applications,

Infrastructure, and Financial Capital, provided that could contribute to the delivery of a Service(OGC-V3-SS 2007).

On the other hand, in the definition of Knowledge asset, ITIL states that ‘Knowledge assets are accumulations of awareness, experience, information, insight and intellectual property that are associated with actions and context. Management, organization, process and applications assets use and store knowledge assets. People assets store tacit knowledge in the form of experience, skills and talent. Such knowledge is primarily acquired through experience, observation and training. Movement of teams and individuals is an effective way to transfer tacit knowledge within and across organizations. Knowledge assets in tacit form are hard for rivals to replicate but easy for owners to lose. Organizations seek to protect themselves from loss by codifying tacit knowledge into explicit forms such as knowledge embedded in process, applications and infrastructure assets.

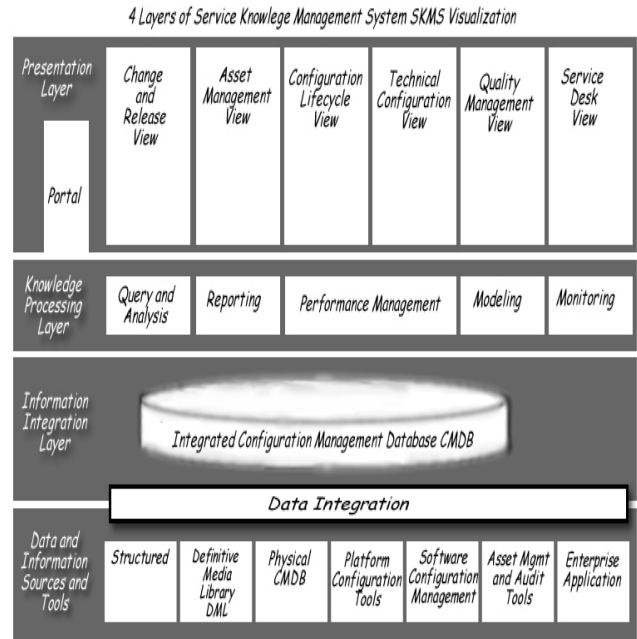


Figure 2: Service Knowledge Management Systems Architecture Layers (OGC-V3-ST 2007)

Finally, ITIL in Service Transition volume clarifies that Knowledge assets include policies, plans, designs, configurations, architectures, process definitions, analytical methods, service definitions, analyses, reports and surveys.

To conclude, as mentioned in previous sections regard to integration of ITIL and EA, the main concern of the authors is the architectures of IT services, which could be considered as one of knowledge assets of IT providers. By refer to SKMS definition it is obvious that SKMS could be considered as a set of tools and databases for storing

and retrieving IT service architectures. Therefore to provide a tool for target framework of the research, researchers will concentrate to design and develop a Service Knowledge Management System to support proposed target framework.

7.0 SUMMARY AND CONCLUSION

In this paper primary issues related to whole research have been discussed. The goal of this research is defined "to develop a comprehensive integrated framework to identify and address IT Service Architecture requirements and issues through using Enterprise Architecture". We called this framework as integrated service architecture framework (ISAF).

The research question related to this paper is "How to fulfill architectural requirements of ITSM/ITIL by using Enterprise Architecture?" Also the research objectives which have led authors for analyzing service knowledge management system were the following:

- To design IT Service Architecture for ITSM and ITIL.
- To develop a framework for integration of ITSM/ITIL and EA.

Knowledge Management process is introduced through Service Transition volume of ITIL V3. The goal of Knowledge Management process in ITIL V3 is to enable organizations to improve the quality of management decision making by ensuring that reliable and secure information and data is available throughout the service lifecycle.

Service Knowledge Management System (SKMS) is referred ITIL V3 as a set of tools and databases that are used to manage knowledge and information. The SKMS stores, manages, updates, and presents all information that an IT Service provider needs to manage the full Lifecycle of IT Services. In IT Service Management knowledge assets includes policies, plans, designs, configurations, architectures, process definitions, analytical methods, service definitions, analyses, reports and surveys.

Through analyzing Knowledge Management process and Service Knowledge Management System which is

introduced by ITIL, it realized that regard to integration of ITIL V3 and EA, as main concern of the authors, architectures of IT services can be stored and retrieved by SKMS. In other word, SKMS could be considered as a set of tools and databases for storing and retrieving IT service architectures. Therefore researchers could plan to provide automate tool for target framework through design and develop a Service Knowledge Management System to support it.

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