An ITIL-based Solution to Record and Retrieve Tacit and Explicit Knowledge based on Giga Knowledge Management Framework in the SME Companies

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Abstract

ITIL is the most widely used IT framework in most organizations in the world now. Every public and private IT organization tries to adopt ITIL into its own business and implement it because there are a lot of different kinds of information and activities in the organizations that should manage. There is a possible solution to record and retrieve those founded information in the ITIL-based repository which its name is Configuration Management Data Base (CMDB).

Also SME companies have high impact on business market, today. SME's are engines of developing the economy of developing countries.

In addition, one of the most practical Knowledge management Frameworks is suggested by Giga Information Group which is a circular model with four stages that represents what people generally do with knowledge.

This paper tries to extend the usability of this ITIL-based repository in to other parts of the SME's as well to cover four stages of knowledge management framework.

1. Introduction

Knowledge Management (KM) comprises a range of practices used by organizations to identify, create, represent, and distribute knowledge. [1] The purpose of Knowledge management is to ensure that the right information is delivered to the appropriate place or competent person at the right time to enable informed decision. The goal of knowledge management is to enable organizations to improve the quality of management decision making by ensuring that reliable and secure information and data is available through the service life cycle.[2]

Organizations engage in KM in order to enhance: Their productivity and quality, through innovation; their stock of intellectual capital; their relationships with customers, suppliers, shareholders, regulators; their strategic decision-making; their competitiveness and their profitability. KM is typically displayed within the Data-to-Information-to-Knowledge-to-Wisdom (DIKW) structure which data is a set of discrete facts about events [3], information comes from providing context to data [4], knowledge is composed of the tacit experiences, ideas, insights, values and judgments of individuals [5] and wisdom gives the ultimate discernment of the material and the application and contextual awareness to provide a strong common sense judgment. [6]

There are several knowledge management models which introduced in the world until now. Some of them are Frid framework for enterprise knowledge management[7] and Stankosky model for Creating the discipline of knowledge management [8],but one of the most practical knowledge management frameworks is suggested by Giga Information Group that in this paper will describe later. [9]

ITIL (Information Technology Infrastructure Library) is most widely used de-facto standard which was introduced and distributed by Office of Government Commerce (OGC) in UK [10] and includes all IT parts of companies. This de-facto standard has several processes that the core process of this de-facto standard is "Configuration Management" which includes a repository which was named: Configuration Management Data Base (CMDB). This repository is widely used in many companies [11,12]. CMDB tries to Record all stuffs in the organization related to IT department of that organization.

This paper, at first describes the Giga group knowledge management framework, then defines ITIL framework and finally introduces an ITIL-based solution to record and retrieve tacit and explicit knowledge based on Giga group

knowledge management framework for the SME's companies.

2. Giga group knowledge management framework

Giga information group [13] is a research company that published this model for managing intellectual capital in the companies. This model, as it can be shown in the figure 1, is circular and it has four stages that represent staff activities with knowledge and it includes three types of capitals which are human, structural and customer capitals. These four stages are:

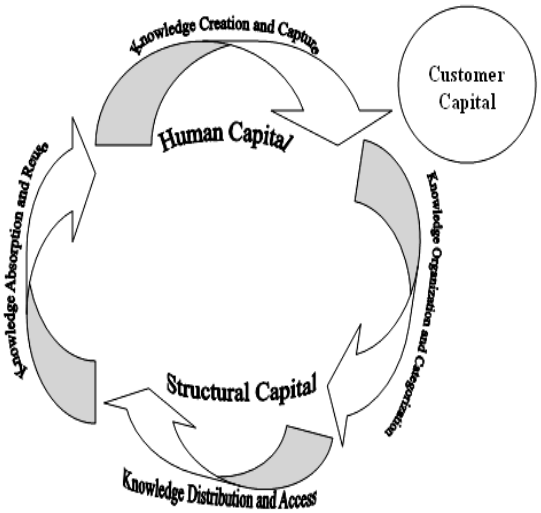

Figure 1:Giga group knowledge management framework

- **Knowledge creation and capture**

In this stage, staffs create and capture knowledge from a resource. It can be done by nurturing staffs to create knowledge or by acquiring it from outside of the company. This stage is deal with human capital and customer capital and high-touch approaches such as creating a sharing culture, urging people to meet either a person or electronically, and encouraging innovation.

- **Knowledge organization and categorization**

This stage can be handled by creating best practices knowledge bases or metadata indexes for documents and also improve its knowledge-support processes. In addition, there is this possibility to measure intellectual capital in the company.

- **Knowledge distribution and access**

This stage includes both pushing knowledge out to staffs (distribution) and supporting them to pull information to themselves (access). In this stage use of high-tech approaches also applicable. These approaches focus on implementing networks and networking tools to access human and structural capital. Intranets and groupware are important IT-based tools in this stage. In order to distribute and reuse knowledge in the company, certain staffs can be dedicate as technical knowledge experts to disseminate tacit knowledge which are knowledge that are hard to catalog, highly experiential, difficult to document in detail, ephemeral and transitory through the company..

- **Knowledge absorption and reuse**

In this stage, in order to build expert human capital, the aim is to get knowledge into staff's heads where it can be enhanced and reused. There is possible to use high-touch approaches such as computer based approaches to manage and enhance knowledge in the company. This phase is focus on nurturing interactions among staffs, recognize the knowledge brokers who exist in the companies and support communities of practices.

And their capitals that these four stages produce them are:

- **Human capital**

This form of intellectual capital consists of knowledge, skills, and innovativeness of employees. And also company values, culture and philosophy. Thus kind of capital creates during the creation- capture and reuse-absorption of the knowledge because these two stages are focus on share knowledge in the company.

- **Structural capital**

This kind of capital is embedded in hardware, software, database, organizational structure and its processes, patents and trademarks to support staffs and their relationships with customers. This kind of capital forms in the knowledge organization-categorization and knowledge distribution-access stages because these two stages focus on moving tacit knowledge to explicit knowledge like tangible knowledge company asset. Therefore, technology based issues such as ITIL framework and other tools and standards are applicable to manage and share knowledge here.

- **Customer capital**

The strength of a company is depending on this form of intellectual capital because customer is a franchise for companies in today's business. This kind of business can be either human (relationships with the company) or structural (products used from the company). [9]

3. ITIL

ITIL (Information Technology Infrastructure Library) is a de-facto standard which introduced and distributed by Office of Government Commerce (OGC) in UK and includes all IT parts of companies [14]. At present ITIL is the most widely accepted approach to IT Service Management in the world. It has an iterative, multidimensional and lifecycle form structure. ITIL has an integrated approach as required by the ISO/IEC 20000 standard with following guidance: [15]

■ Service Strategy

The Service Strategy provides guidance on how to design, develop and implement service management from organizational capability perspective and strategic asset. It provides guidance 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. Service Strategy guidance is applicable in the context of other parts of ITL lifecycle. Service Strategy covers these parts of IT systems: the development of markets, internal and external, service assets, service catalogue and implementation of strategy through the service lifecycle.

Service Strategy includes these processes:

- Financial Management
- Service Portfolio Management
- Demand Management [16].

■ Service Design

It is 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. The scope of Service Design is includes the changes and improvements necessary to increase or maintain value to customers over the lifecycle of services, the continuity of services, achievement of service levels and conformance to standards and regulations. It guides companies on how to develop design capabilities for service management. Service Design includes these processes:

- Service Catalogue Management
- Service Level Management
- Capacity Management
- Availability Management
- IT service Continuity Management
- Information Security Management Supplier Management, Application Management
- Data and Information Management Business Service Management [17].

■ Service Transition

It is guidance for the development and improvement of capabilities for transitioning new and changed services into operations. Service Transition provides guidance on how the requirements of Service Strategy encoded in Service Design are effectively realized in Service Operation while controlling the risks of failure and disruption. This part of ITIL framework combines practices in release management, program management and risk management and places them in the practical context of service management.

Service Transition processes are:

- Change Management
- Service asset and Configuration Management
- Release and deployment Management
- Knowledge Management
- Stakeholder Management
- Transition Planning
- Support and Service Evaluation [18].

■ Service Operation

Service Operation tries to embody practices in the management of Service Operation. 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. Strategic objectives are ultimately realized through Service Operation, therefore making it a critical capability.

It processes are:

- Event Management
- Incident Management
- Request Management
- Problem Management
- Access management [19].

■ Continual Service Improvement.

This is including of instrumental guidance in creating and maintaining value for customers through better design, introduction and operation of services. It combines principles, practices and methods from quality management, Change Management and capability improvement. Companies learn to realize incremental and large-scale improvements in service quality, operational efficiency and business continuity.
Its processes are:

- The 7-Step Improving Process
- Service Level Management [20].

4. CMDB in ITIL

As already stated, Configuration Management Data Base (CMDB) is a database that contains all relevant information about the components of the information system used in an company's IT services and the relationship between those components. It can be said that CMDB should be able to answer these questions:

- What do we have?
- Where is it?
- What state is it in?
- Who is responsible for maintaining it?
- Who uses it?
- What depends on it?
- What does it depend on?
- What is it part of?

The challenges and risks are associated with the actual implementation of CMDB. However it specifically depends more on the approach which is taken for the project. There are two major approaches to implement CMDB:

- Top-down approach

Top-down approach means that the analyzer should start by identifying its most critical business services and then concentrate on defining only the key performance enablers for the delivery of those services.

- Bottom-up approach

This approach involves cataloguing every device and application plugged into organizations' infrastructure [21].

Every approach has its own advantages and disadvantages. Basically, it depends on the experience of consultants, types of projects and other reasons, one approach will be selected. The characteristics and challenges of these two approaches are shown in Table 1. Implementation of CMDB in the companies by selecting such approaches will be started. It is too important that respective approach should record all stuff, their relation, their changes and their case histories. In addition CMDB can include point of view of users, consumers and staff.

Table 1. Comparison Challenges of two Approaches [22].

	planning	challenges
Top down approach	Objectives and benefits Organizational readiness, teams and responsibilities Design and scooping Metrics for success	General understanding of what CMDB is and what it offers How and where to apply it Securing the support of senior management
Bottom up approach	Granularity of CIs (if you chose an all encompassing approach you risk mirroring this in the design phase too)	General understanding of what CMDB is and what it offers finding the time to investigate and bring it on board Enabling technologies

5. CMDB and KM framework in the SME's

The structure of this database can be extended to record all stuff related to all parts of the SME's company especially when CMDB has capability to record multimedia, graphics, sound and documents. So CMDB do not just record all material and information related to IT part of the SME's company, it also records other stuff as well. In addition, the concept of this database can be extended to record all other information such as:

- Staffs skills
- Staffs experiences
- Technical information
- Machines documents
- Certificates
- Standards
- Process activities
- Meeting brainstorming
- Recorded workgroup activities and shared experiences

Therefore, there is this possibility to create the knowledge based on recorded material in the CMDB which is not just some records but also experiences, intellectual recorded subjects and

such records. These activities occur in the first stage of KM framework which is Knowledge creation and capture, then in order to have well-structured categorize they will put in CMDB with unified primary and if it is needs secondary key as well. These technical issues are managing by Configuration management process. This process also tries to manage all developments, changes and releases in the company. This activity happen knowledge organization and categorization stage that tries to handle created best practices knowledge bases or metadata indexes for documents and also improve its knowledge-support processes. When these knowledge are needed this is possible to retrieve them via primary keys or predefined indexes in the CMDB. So during third phase of KM model which is knowledge distribution and access this is possible to access human and structural capital. This phase is done by technical staffs to train of convey this knowledge between applicants. During this phase there is possible to gather more experiences to record them in the CMDB as well. In order to localize and domesticate knowledge in the company computer based solutions can be applied too.

Conclusion

Now days, human capital plays an increasing rule to success SME's companies in the market. KM model which introduced by Giga information group is a good example of practical solution to clarify role and importance of knowledge in the company and how to manage and absorb it in the company. This KM framework is consists of four stages which are Knowledge creation and capture, Knowledge organization and categorization, Knowledge distribution and access and Knowledge absorption and reuse. In addition KM framework believes three kinds of capitals which are Human capital, Structural capital and Customer capital.

ITIL is a set of best practices that can be applied to all parts of SME companies and extend its capabilities to record tacit and explicit knowledge in CMDB and use them what and when ever staff need them. This database manages by configuration management process and it is responsible to manage, update and apply its content in the SME company.

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