"IT SERVICE MANAGEMENT SYSTEM FOR CENTRAL BANK OF SUDAN"

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ABSTRACT

IT Service Management System is an application to implement and manage Information Technology Infrastructure Library (ITIL) best practices framework. This framework aims to align the IT services with the business needs by insuring the quality of services provided to business. This IT service Management system links people, processes and technology within the Central Bank of Sudan as the main site of the project.

The Central Bank of Sudan is the main bank that governs Sudan's banks rules and regulations. The bank was formed in 1960 with headquarters located in the Khartoum capital of Sudan in addition to eighteen (18) branches spread throughout the country. The Information Technology Administration within the Central Bank of Sudan manage and operate the IT infrastructure that host and support all systems that used internally and for external banks.

The objective of this study focused on finding IT service management system that can support international IT service management platform that can apply ITIL standard processes like Incident Management, Service Request Management, Problem Management, Change Request Management, Configuration Management Database and Knowledge Management.

The methodology used in this system is the Rapid Application Development (RAD), a condensed development process that produces a high quality system with low investment costs.

The proposed system went through to alpha, beta and acceptability tests by IT development team first and second line of support agents to ensure proper module functionality with favorable results.
The study concluded in align services provided by the Information system department with business need through manageable and controllable standard. As a recommendation, the system should be implemented at the Central Bank of Sudan. More integrations and benchmarking must be done to ensure modules functionalities and higher security. The system can be the first step to take ISO20000 certificate as it covers many of ISO20000 requirements.

KEYWORDS

IT Service Management System, Information Technology Infrastructure Library, Rapid Application Development Methodology, Change Management

1. INTRODUCTION

IT service management (ITSM) is the process of aligning enterprise IT services with business and a primary focus on the delivery of best services to end user. ITSM deals with how IT resources and business practices together are delivered in such a way that the end-user experiences the most desired result from the accessed IT resource, application, business process or an entire solution stack.

It is used to cover the wide range of supporting software products that the modern organization needs to facilitate their ITSM efforts. It includes IT service management software products that have a singular purpose such as configuration management databases (CMDBs), through help desk products with ticketing functionality, to IT Service Management software "suites" that provide support for multiple ITSM processes or activities. It can also include ITSM software products that provide support or capabilities that are at the periphery of ITSM, such remote control/remote support or IT asset management (ITSM) capabilities (for instance, network discovery and asset inventory control and tracking).

The Information Technology Infrastructure Library (**ITIL)**, an ITSM best practice framework, defines ITSM as "the implementation and management of quality IT services that meet the needs of the business." Although encapsulated in a few words, this is clearly a large and complex body of work activities and since nowadays just about every organization relies heavily on IT to deliver its business commitments, this means that ITSM is a vital task as well as a complex one.

ITIL also tells us, in that same definition, that ITSM is "performed through an appropriate mix of people, process and information technology" – with that technology made up of ITSM software as well as other IT management software products. Additionally, ITSM software is often viewed as a subset of IT management software, along with things like network monitoring, hardware monitoring or application performance management tools.

The "implementing and managing" of the ITIL definition covers a range of ITSM activities – from setting service strategy, through releasing, testing, changing, improving, and monitoring services, to dealing with any unexpected or unwelcome feature or issue that each and every step might deliver.

Once this is realized, it soon becomes clear that most organizations need a wide range of people along with detailed, and comprehensive, processes to do ITSM properly. To support all this, you need a complex set of IT Service Management software products to coordinate, support, manage, and document the people and the processes.

Organizations need that solid base of an ITSM software product or suite that integrates the key ITSM processes of configuration, **incident management**, **problem management**, **change management and release management**. Once that solid base is proven and accepted in a single ITSM software product, providing a direction for the organization and shared data set – it becomes easier to expand IT service management software support to address other ITSM processes, potentially with other products. Just about every ITSM process uses data that is captured and maintained by the core set of processes.

Upon this firm base, organizations can then look to add in more features within their IT service management software suite. Processes that expand and build upon the core ITSM software capabilities include:

Service level management – documenting, monitoring, and reporting on the agreed service levels for support and IT services

Availability management – establishing and measuring potential and actual availability levels, and reporting on trends and recommending actions to maintain availability levels as required

IT service continuity management – supporting techniques to ensure services can be delivered, perhaps to a degrade level, when major incidents affect the organization

IT service management software support for these processes relies heavily on access to accurate and up-to-date information about the services and the infrastructure via which they are delivered.

In order to provide the highest level of service to clients at the Central bank of Sudan, IT department as a service provider must utilize all of the appropriate tools, as well as have the appropriate resources in place. By implementing a service desk to continually working to optimize IT service delivery while managing all internal operations and processes, as well as ensuring clients' needs are met. If implemented according to best practices, the IT service provider will enjoy decreased operating costs and increased client satisfaction.

The Central Bank of Sudan is the main bank that governs Sudan's banks rules and regulations. The bank formed in 1960, four years after Sudan's independence. It is located in the capital Khartoum. The adoption by a country of a particular economic system, may call for its Central Bank to carry out certain functions, which differ substantially from those of central banks in other economic systems. Each Central Bank has its own Act specifying these functions, which amended as deemed necessary.

The general objective of the proposed study is to design, develop and implement IT Service Management System for Central Bank of Sudan helps to manage all of services, assets and support with a single, modern, easy-to-use IT Service Management (ITSM) application and get IT support under control, reduce costs and align IT activity with business priorities.

Specifically, the project aims to serve and resolve problems of IT service management to IT customers, IT employees and top management as follows:

On Customers:

- To develop modules that would allow customers to log incidents in many way;
- To create module that track Service level agreements which specialized in time management of solving incidents and requests according to pre agreed impact and urgency;
- To create module that allow customers to monitor progress of their request; and,
- To create a knowledge-based module where customers can find solutions to small issues without the intervention of the service desk agent.

On Service Provider(IT employees):

- To create and develop centralized ways to act as a single point of contact to issues be registered in the system;
- To create and implement organizational level agreements between the first line of support (The service desk section) and the other IT sections that provide the second line of support;
- To activate the role of incident management to monitor and control incidents and prove the accuracy of reports provided about the IT support;
- To develop a problem management module that allow keep record of the known errors and find the root cause of problems to decrease the number of incidents that the first line of support need to deal with;
- To create changes management module that linked with list of approval and testing and proper transition; and,
- To create assets management module responsible in tracking and managing all IT assets.

On Top Management:

- To create reports and dashboards that prove productive IT department that delivers measurable business values.

This study has many advantages as following:

- **For the Central Bank of Sudan** and its referrals will benefit from deploying international standard (ITSM)which integrating all service delivery and service support processes within a single application to drive rapid improvements in IT maturity, agility and efficiency. The study works on the registering, tracking incident management, service request management, problem, change management beside monitoring resolution timing through Service level agreements. IT department will benefit from implementing ITIL® processes that can insure the quality of services provided. Also it will increase users and top management satisfaction to trust the IT Services

- **For Researchers** the study will spotlight the implementation of IT infrastructure library processes through the IT service management system in real world.

- **For future researchers** the study will be a foundation to build up and go further in deep IT service management processes like change management and assets configuration management, which will support the IT infrastructure integrity and availability.

The IT service management system includes the following functionality:

- Enable IT to manage, control and keep records of all incidents, service requests, problem and changes in one system
- Provide service level agreements configurations
- Provide Self services includes Service Catalog and Incident logging
- Enable track all assets in configuration management database CMDB
- Provide accurate reports of the IT infrastructure assets and support situations

However, the design and implementation of the proposed system does not include external intranet and supplier management part.

2. REVIEW OF RELATED LITERATURE AND STUDIES

Barclay Rae (2017) discussed in the IT Service Management Forum that views and outcomes for Service Management are generally holding up. In his research, he mentioned that 89% of respondents see ITSM as a value add to their business – mostly in support of customer experience (35%) and service quality (48%). Supporting the management of risk (5%) and innovation (6%) are both emerging as objectives from ITSM although still in generally at a low level. The big challenge remains in how to quantify this value in business terms – there is still the direct correlation between the successful presentation of business-focused metrics and outcomes, and the extent to which the IT organization is perceived to be delivering value.

ITSM in general is seen to be most effective in large organizations, although interestingly the area most keen to invest more in ITSM is the SME sector. Other areas such as Digital Transformation and Cyber Security continue to be important to ITSM and vice versa. There is a continued and increased focus on the definition of the 'ITSM professional' and the broad range of skills and competencies needed to maintain and develop in ITSM roles.

Most comfortingly overall, there is a slight increase in the planned investment in ITSM in the coming year – this is reducing slightly in very large organizations but in general is holding up and a very positive picture for the industry. This is particularly impressive at this time where there is considerable market uncertainty.

Ad a (2010) explicitly defined that due to the forces of Internet and Globalization, the market that all organizations encountered is fiercely competitive and highly dynamic. The demand for revenue growth with cost containment, quick response to customers and seeking for new opportunities also struggle every private and public sector. In the current organization paradigm, Information Technology (IT) provides essential services for the organization to support its business. As the dependency upon IT increases, IT, previously as a supporting role, has become the determining asset that can generate business value and gain the competitive advantages for organizations. This transformation has resulted in an imperative need for the quality of the IT services. Providers of IT services, either internal IT department or external partners, can no longer be technology-focused but start to consider the quality they provide and focus on meeting the requirements and expectations of the customers.

Five Key Processes of ITSM Implement of all the processes have a large overload. So some organization cannot implement all of them. In this situation, at least five key processes must be implemented: Incident management, Problem management, Change management, Configuration management and service Level management. The traditional ITSM processes rely on a central CMDB. Looking to a cloud environment, Configuration items (CI) are distributed across a numerous service providers and there is no single-point-of-truth. Thus the approach of a central CMDB does not work in a cross domain or cross-provider environment. Especially the lack in notion of dependency of one CIon another seems to be an actual challenge. Given these pre-conditions, Wassermann et al. (2009)respectively Ludwig et al. (2009) designed the "Distributed Configuration Management" (DCM)and "Smart Configuration Items" (SCI) which can be exposed to other domains using a defined interface based on Representational State Transfer (REST), IBMs Web Spheres Mash, Mash ups and AJAX (Fate me, 2014).

Problem management has the dual goals of minimizing the adverse impact of errors within the IT infrastructure, and preventing the recurrence of incidents related to those errors and classes of those errors. However, many organizations believe they have implemented problem management when in reality they may have only become better at managing incidents. These organizations do not fully execute or manage all facets of problem management and therefore do not realize its full benefits. (Pankesh, 2009)

3. DESIGN AND METHODOLOGY

The proposed system is a web application that enables two fronts ends one for the IT users and for the end users. The system consists of Database Server, application and integration server beside Exchange server. It will include modules on Service management, self-service, service catalog, assets management.

Rapid Application Development Methodology was used for the software engineering of the proposed system as it is major concerns is the quality and cost

The use case has many actors: system administrator, service desk agent, other service department agents, clients and mangers. The following diagram shows their roles within the system:
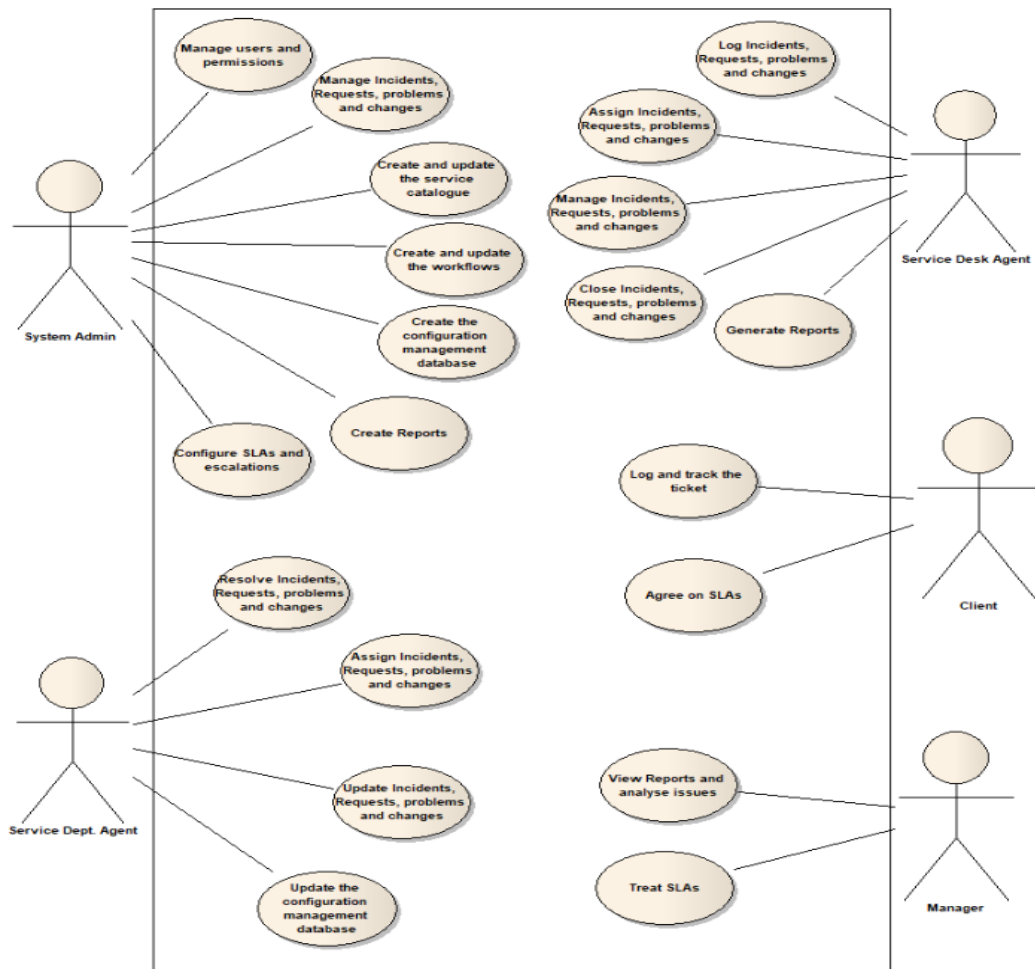
Figure 1.Use Case Diagram

Alpha testing is an initial phase of validating whether a new product will perform as expected. Alpha is carried out in the development process by internal staff and then followed by beta testing.

The developer team tested the system functionality against the best practice and the feature required by the information system department. The test started by the main functions of incidents; and how it was converted to major incident. Service request were tested in the IT users portal and the service catalog. Problems and change request were tested accordingly. Configuration management database items and connected items where shown in the test to insure it is consistency. Workflow process stages and links tested regarding to system issues. Reports and dashboard also tested. The user portal effectiveness was taking a part from the testing

The beta test was done by Central Bank of Sudan support team the first line of support and some of service department the second line of support. A survey was conducted after using the system and the result was positively acceptable. The Acceptability Test was conducted by six (6) users at the Central Bank of Sudan composed of support team, the first line of support, the second line of support, and some of service department. The survey was conducted after using the system for five days and the result as like the following: Two (2) users strongly agreed that the system helped them to control and mange issues, another two users agreed that the system helped them become more confident in monitoring the issues, while one user remained undecided. Furthermore, one user disagreed as he was not able to foresee the impact of the system on the

long term and he needs more time to be able to understand the benefits. As for the friendliness of user interface and the ease of use six users agreed that the system is user friendly. However, the commented on the system would require more training to user across the IT Department other users who have little experience with systems.

In addition, four (4) users agreed that the system was able to manage issues in a faster manner than the usual manner successfully every time. Four users (4) expressed their satisfaction with the system while the remaining two think that the system needs more clarification on ITIL standard to understand the work well.

Recommendations for the users that have concern in the system is to make sure that they are aware of ITIL foundation to make better utilization of the system and accept it The IT manager appreciated the system as it covers all ITIL standard aspects and accept the challenge to have an international standard to manage the service.

4. CONCLUSIONS AND RECOMMENDATIONS

Based on the findings and analysis of the developed system, the following conclusions were drawn: customers can log incidents through customer portal beside the traditional ways; service level agreements were stated to categories to manage time of solving incidents and requests problems and changes according to the priorities. Moreover, notification messages and workflows status will allow monitor progress of incidents and requests. All incidents, requests, problem and changes are monitored completely through the system, Configuration management database keep responsibilities of all IT assets and relation and reports and dashboards are well defined and seen by the targeted people.

The following recommendations are hereby drawn: The Central Bank of Sudan should implement this solution to cope with the international standard in managing information technology services, training must be conducted to all levels in the IT Department, and dashboard must be activated for managerial level to be aware of the overall status and the scale of the work. Future researcher can seek in more integrations and bench marking the system with the real standard. The system can be the first step to take ISO20000 certificate as it covers many of ISO20000 requirements.

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