Advantage of using Service Desk Management Systems in real organizations

Anel Tanovic*, Nikos E. Mastorakis**
*Department of Computer Science and Informatics University of Sarajevo, Faculty of Electrical Engineering
Zmaja od Bosne bb, Sarajevo 71000, Bosnia and Herzegovina
atanovic@etf.unsa.ba
**WSEAS (Research and Development Department)
Agiou Ioannou Theologou 17-23, 15773,
Zografou, Athens, Greece, www.wseas.org

Abstract: - This paper describes the importance of introducing of IT Service Management (ITSM) systems, frameworks and standards in a real environment of one company. For the environment in this research it is used a network of one Faculty of Electrical Engineering in Bosnia and Herzegovina. During this research the authors have fully implemented five ITSM processes through the realization of the Service Desk Management System which connects all other systems and network elements on Faculty. Fully implemented are these processes: Service Catalogue Management, Incident Management, Problem Management, Change Management and Service Asset & Configuration Management. This paper has professional and scientific contribution. Professional contribution is the real implementation of Service Desk Management System in a real environment of one Faculty and its releasing into production. Scientific contribution is the raising of awareness of all individuals and organizations about the importance of introducing of ITSM systems, frameworks and standards in one real company or organization because of the positive results which will be described through this paper.

Key-Words: - SDMS, ITSM, Service Catalogue Management, Configuration Management, Change Management, Incident Management, Problem Management.

1 Introduction

This paper describes the process of implementation of ITIL framework at the Faculty of Electrical Engineering. This ITIL implementation is based through the installation of one ITSM tool with a name Service Desk Management System (SDMS). This ITSM supports five ITIL processes from three different phases which include: Service Catalogue Management (Service Design), Service Asset & Configuration Management (Service Transition), Change Management (Service Transition), Incident Management (Service Operation) and Problem Management (Service Operation).

Service Catalogue Management is the process responsible for providing and maintaining service catalogue. This process ensures that the service catalogue is accurate and available to those who need it. Incident Management process helps restore normal IT service operation as quickly as possible. Incidents are events that are not part of the standard operation of a service. These events may cause an interruption to or a reduction in the quality of that service. Incident Management is meant to minimize impact on University business operations. The objective of the Change Management process is to standardize the methods and procedures used throughout IT to promptly and efficiently handle all changes to IT services. Change Management is intended to minimize the number and impact of incidents related to a change upon a service. The Problem Management process is responsible for managing the lifecycle of all IT problems within IT. Problem Management is meant to proactively prevent incidents from happening and minimize the impact of incidents that are not preventable. Configuration Management collects different elements from the company's IT infrastructure and stores all of them in Configuration Management Database (CMDB) which becomes the part of the Configuration Management System (CMS). Elements which are the part of this system are called as Configuration Items (CIs). This process is the detailed recording and updating of information that describes an enterprise's hardware and software.

Section II. describes the reference model and the previous research connected to this area. Section III. of the paper shows the process of the implementation of SDMS at the Faculty. Section IV.

shows the comparison of results before and after the implementation of SDMS. Section V. is the conclusion of the paper in which are described the advantages of using ITSM tools, processes, frameworks and standards.

2 Reference model and previous research

Network architecture for the Faculty is shown bellow on a figure. The Faculty contains Learning Content Management System for the communication with students and University Management System for the enrolling the grades and for the communication with the University management. The third system which is implemented is SDMS and this system will be used for the management of internal processes. In order to produce the highest level of availability, SDMS with all other information systems will be placed on two different servers which are connected through LAN. SDMS at this point of the research will not be connected to other Faculty's management systems. This research will focused only on work of SDMS and its productivity.

SDMS is a fully implemented IT Service Management tool for the purpose of this project. It fully covers the principles of ITIL framework and ISO/IEC 20000 standard. For the purpose of the research described in this paper, we have developed five ITSM processes which are the part of this system: Service Catalogue Management, Incident Management, Problem Management, Change Management and Service Asset and Configuration Management. For the development of the SDMS system, we choosed Waterfall classical model in which we followed all these phases: analysis, design, implementation, testing and education. During the testing phase we have also entered all data from other two Faculty production management systems. SDMS is fully integrated into a business environment of a Faculty before the measurements which are done in section IV. of this paper.

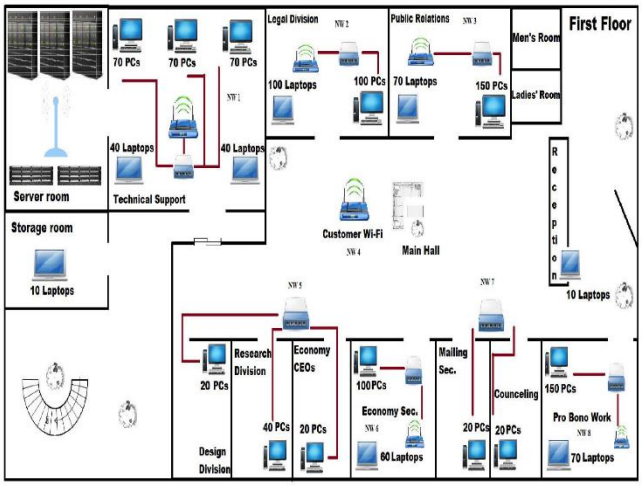

Figure 1. Network architecture for the Faculty

Previous research in this field has been completed in paper [7] for insurance companies and in paper [8] for telecommunication companies. In these papers only Service Desk as a ITSM tool was decribed through the real implementation. Only three processes were included for this research: Incident Management, Problem Management and Change Management. Based on these two researches, the authors have developed SDMS which covers two more processes: Service Catalogue Management and Configuration Management.

This paper [9] reports the results of a two year study of “lead users” of ITIL. The study formed part of a multi study investigation into the role played by ITIL in improving outsourcing outcomes. These “lead users” provided evidence of how, used effectively, ITIL can improve the outsourcing relationship. Informants suggested that the extent to which the client and vendor understand each others' expectations is crucial to using ITIL effectively, as are knowledge sharing and other aspects of good communication. Results from a study [10] show that the key performance indicator, intellectual capital and organization size (in terms of annual budget) are positively associated with the adoption of ITIL in one private University at Malaysia. The paper [11] analyzes data from a survey from 160 Nordic companies about ITIL software quality and ITIL project quality on implementation status. The paper [12] addresses the Enterprise Architecture of organizations that use ITIL best practices to perform ITSM, focusing on the modeling and assessment of ITIL value in those architectures.

3 SDMS implementation

All service catalogues should be established according to SLA contracts between Faculty and their students. The request for a new service catalogue can come directly from some component of hardware and software infrastructure or from Incident Management process. Each request should be assigned to a Technician who should check the compliancy with a SLA contract and then define N different tasks which should be executed in a simultaneous way before the service is delivered to a customer. Service Catalogue Management process is described on a figure 2. which is shown bellow.

The first step for Incident Management process is to identify is one event a real incident. The second step is to do the categorization of incidents in different categories connected to: server infrastructure, network equipment infrastructure, IT operations infrastructure or quality management systems. The third step is to complete a prioritization of all incidents in five different categories of priorities: very low, low, medium, high and very high. The next step is to recognize is this incident a known incident by searching all of them in Knowledge Base. If it is not a known incident, next steps are Investigation & Diagnosis and Resolution. All these steps should be in accordance with SLA contracts. Incident Management process is described on a figure 3. which is shown bellow.

Problem is by a definition a collection of many different recurring incidents. After completing a detection of many recurring incidents the next step is to do a problem analysis. During this process of problem analysis it is very important to identify all possible threats and vulnerabilities in order to finally produce a risk factor. The next step is to provide a workaround which should have a connection to all documents which are the part of Knowledge Base. During this step all announcements should be done and all tasks should be simultaneously delivered to all responsible persons. This process is also recursive process: after closing a problem all incidents and owners should be informed about this in order to close their individual incidents. Problem Management process is shown on a figure 4.

Change Management process in SDMS starts with a request for change which can come directly from students or technicians. The next step is to design a plan how one specific change can be realized. All changes should be approved from a Change Advisory Board (CAB). Change Manager is a responsible person only for delivering and managing of all changes which CAB is only responsible role for the approving a realization of changes. This process in SDMS contains Backout Plan and Rollout Plan in order to make a connection to Incident Management or Problem Management process. Figure 5. describes Change Management process for SDMS. The successful implementation of Change Management process is described through the implementation of Incident Management and Problem Management process which are directly connected to customers.

SDMS supports a Configuration Management Database (CMDB) which consists of many different Configuration Items (CIs) which represent different hardware, network and software elements: servers, routers, switches, computers, information systems, applications, rooms, IP camera's, certificates, other network elements etc. This CMDB for SDMS supports a creation of many different relationships between all these different CIs. Configuration Management also supports different alarms which are activated in situations when one CI falls down which could affect some other CI which is placed in the same database. There is also a possibility that more then one CI could be also breaken which could at the cause the fall of the entire service which is by Faculty provided to its students and other interested parties. Configuration Management process for SDMS is described on a figure 6. which is shown bellow.

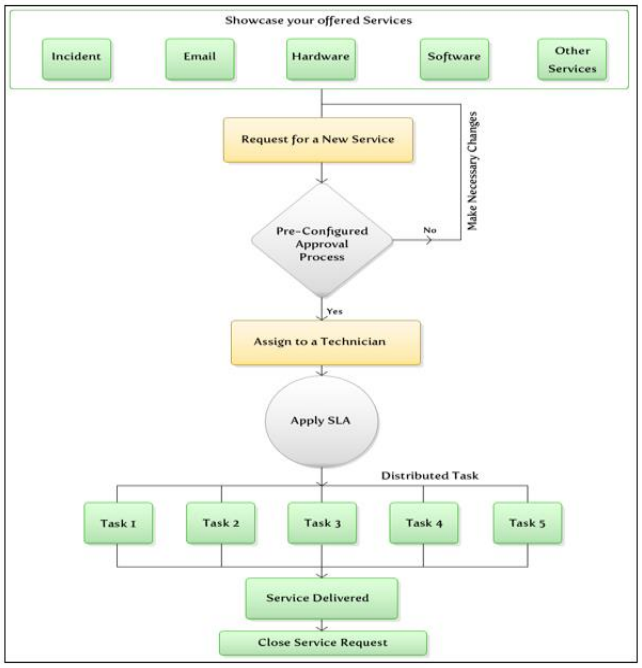

Figure 2. Service Catalogue Management for SDMS

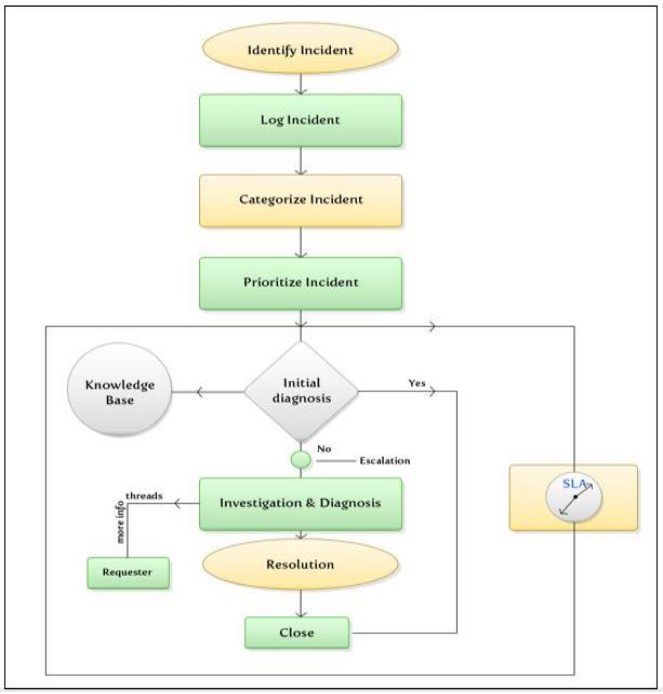

Figure 3. Incident Management for SDMS

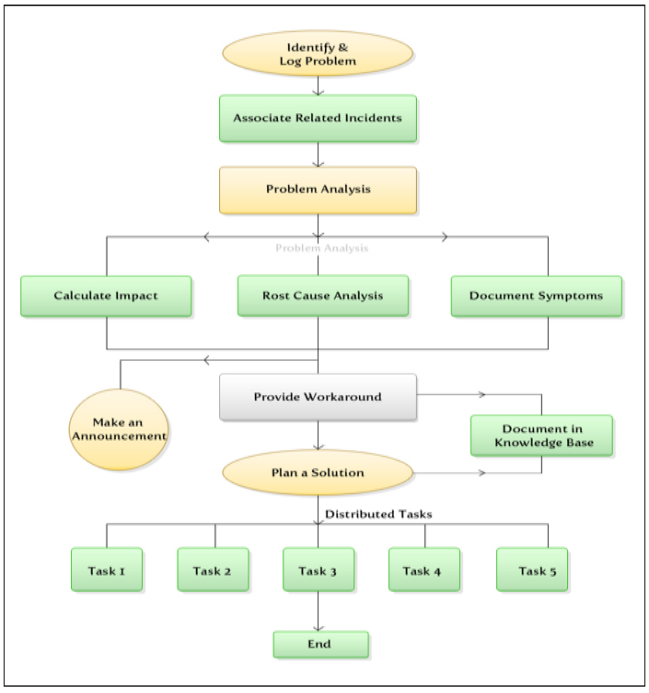

Figure 4. Problem Management for SDMS

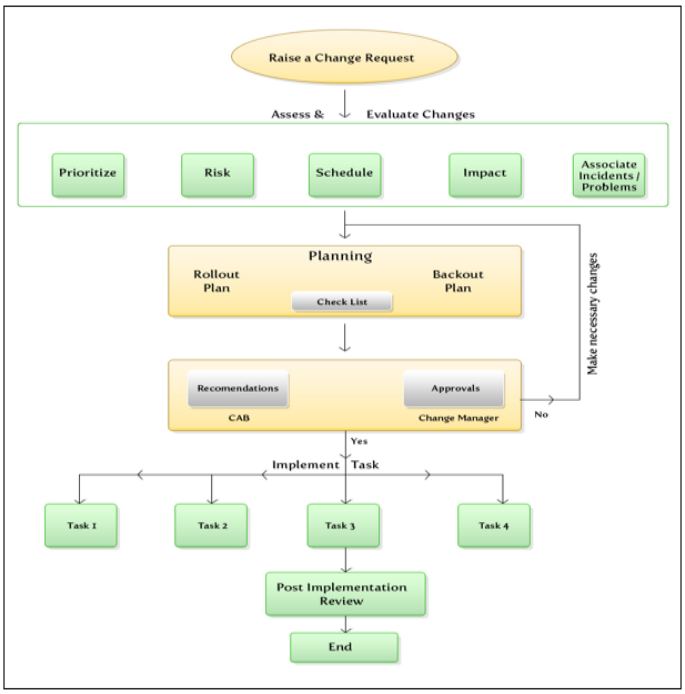

Figure 5. Change Management for SDMS

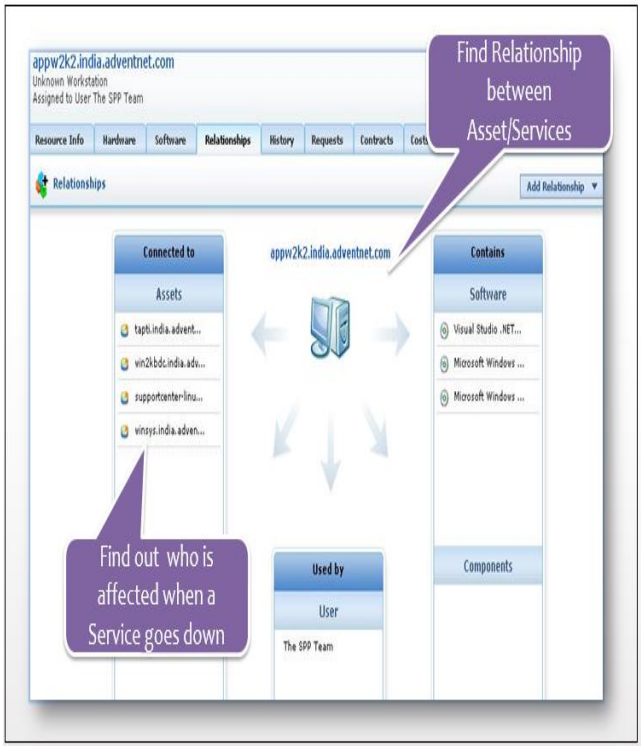

Figure 6. Configuration Management for SDMS

4 Measurements and comparison of results

In order to compare the efectiveness of all Faculty information systems and elements before and after the implementation of SDMS, we defined 13 Key Performance Indicators (KPIs) for all processes which are the part of SDMS. The aim was to compare the time and speed in solving all user's

requests and in maintenance of the network infrastructure during the normal operations. All defined KPIs are taken from ITIL 'best practices' original books and according to the previous research which was done in this field. The aim of this measurement was to perceive how the overall system on Faculty works better after the releasing into a production of a new SDMS system.

Results from table 1. have showed that results on Faculty elements are better for 35.68% after the implementation of SDMS. For all 13 KPIs results are better after the implementation of SDMS especially in these categories: successful recovery of all IT services, evaluation of all SLA contracts between Faculty and other interested parties, creation of service catalogue during the process of collection of all network elements and human interventions needed for the maintenance of network architecture. In these categories a new created SDMS has accelerated the normal work of all Faculty systems between 50% and 80%. Figure 7. shows this comparison between results before the implementation of SDMS and after the implementation of SDMS.

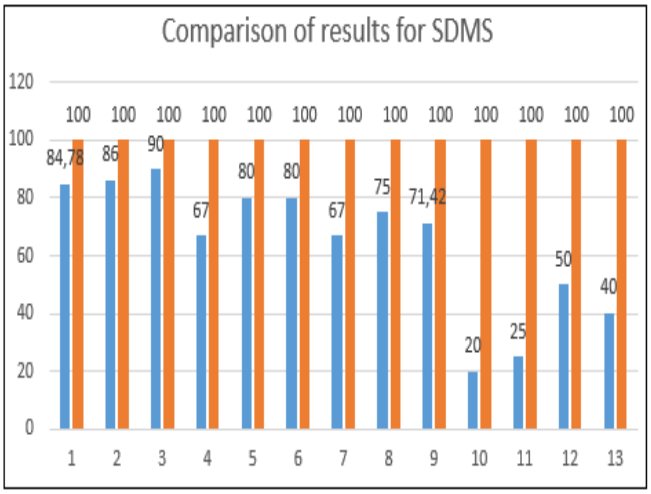

Figure 7. Comparison of results for all 13 KPIs

5 Conclusion and future research

Results from the previous chapters have showed that the results of many important factors for the organization are better for even 35.68% which is significant and important result. It means that the SDMS software produces a better result for the overall work of one organization. Advantages through the implementation of SDMS are: faster resolution of incidents, problems and changes, better involvement of CIs during the process of creation of service catalogues, better process of successful recovery of all IT services, smaller number of human interventions during the maintenance of one real product, better connection between all possible IT elements and creation of different alarms in situations when one IT element falls down.

For this research, we used only five different ITSM processes. For future research we will expand the number of processes in our SDMS and add primarly these processes: Service Level Management, Supplier Management, Knowledge Management, Request Fulfillment and Project Management. The aim is to see will this result of improvement which is expressed as 35.68% will maybe be even better.

References:

[1] J. van Bon, A. de Jong, A. Kolthof, M.Pieper, R. Tjassing, A. van der Veen, and T. Verheijen, "Foundations of IT Service Management Based on ITIL 2011", The Office of Government Commerce, September 2007.

[2] S.Taylor, M. Iqbal, and M. Nieves, "ITIL Version 3 Service Strategy", Cabinet Office, July 2011.

[3] S.Taylor, V. Lloyd, and C. Rudd, "ITIL Version 3 Service Design", Cabinet Office, July 2011.

[4] S.Taylor, S. Lacy, and I. Macfarlane, "ITIL Version 3 Service Transition", Cabinet Office, July 2011.

[5] S.Taylor, D. Cannon, and D. Wheeldon, "ITIL Version 3 Service Operation", Cabinet Office, July 2011.

[6] S.Taylor, G.Case, and G.Spalding, "ITIL Version 3 Continual Service Improvement", Cabinet Office, July 2011.

[7] A.Tanovic, A. Butkovic, F. Orucevic and N. Mastorakis, "Design and implementation of new ITIL Service Desk for insurance companies", 2nd International Conference on Wireless and Mobile Communications Systems (WMCS14), Lisbon, October 2014.

[8] A.Tanovic, A. Butkovic, F. Orucevic and N. Mastorakis, "Advantages of the implementation of Service Desk based on ITIL framework in telecommunication industry", 2nd International Conference on Wireless and Mobile Communications Systems (WMCS14), Lisbon, October 2014.

[9] M.Alojail and B.Corbitt, "ITIL Maturity Model of IT outsourcing: Evidence from a 'leading user'", 9th Iberian Conference on Information Systems and Technologies (CISTI 2014), pp. 1-5, 2014.

[10] J.M.Saleh and M.K.Almsafir, "The Drivers of ITIL Adoption in UNITEN", 2013 International Conference on Advanced Computer Science Applications and Technologies (ACSAT 2013), pp. 479-484, 2013.

[11] T.R.Eikebrokk and J.Iden, "ITIL Implementation: The Role of ITIL Software and Project Quality", 23rd International Workshop on Database and Expert

Systems Applications (DEXA 2012), pp. 60-64, 2012.

[12] M.Vicente, N.Gama, and M.M. da Silva, "The Value of ITIL in Enterprise Architecture", 17th IEEE International Enterprise Distributed Object Computing Conference (EDOC 2013), pp. 147-152, 2013.

Key Performance Indicator (KPI)	**Measured values before the implementation of SDMS**	**Measured values after the implementation of SDMS**
The percentage of successfully resolved incidents	78%	92%
The percentage of successfully resolved problems	86%	100%
The percentage of successfully resolved changes	90%	100%
The average time needed for the successful implementation of all incidents	4h	3h
The average time needed for the successful implementation of all problems	6h	5h
The average time needed for the successful implementation of all changes	6h	5h
The average time needed for the successful realization of service catalogue	12 working days	9 working days
The average time needed for the reporting that one element of IT infrastructure (CI) has been falled down	60 minutes	48 minutes
The average time in fall of all Faculty IT services during one month	9 hours	7 hours
The average number of hours which were needed for the successful recovery of all IT services	18 hours	10 hours
The average time needed for the evaluation of all SLA contracts between Faculty and other interested parties	7 working days	4 working days
The average time needed for a collection of all network elements (CIs) in order to create a service catalogue	72 hours	48 hours
The average number of human interventions for the maintenance of network architecture during the period of one month	16 human interventions	10 human interventions

Table 1. Comparison of measured values before the implementation of SDMS and after the implementation of SDMS