The design and implementation of two new IT Service Management models

Anel Tanovic and Fahrudin Orucevic

Abstract — IT Service Management is a scientific discipline which is responsible for giving instructions connected to the management of IT services. Information Technology Infrastructure Library (ITIL) is the most popular framework for the management of IT services which consists of five phases and 26 processes. ISO/IEC 20000 is the first and only international standard responsible for the management of IT services which consists of four phases and 13 processes. The aim of this paper is to give proposal for the design of two new models of IT Service Management models. The first one is a performed version of ISO/IEC 20000 model which is the result of the comparison with ITIL framework. The second one is a performed version of ITIL 2011 framework which is the result of the comparison with ISO/IEC 20000 standard. Both models are produced in the test environment of IP Multimedia Subsystem (IMS system) in one Telecom operator in Bosnia and Herzegovina. Improvements are done by adding new processes into both process models. New processes which are added into a performed version of ISO/IEC 20000 model are: Event Management, Demand Management, Service Portfolio Management and Service Validation and Testing process. New processes which are added into a performed version of ITIL model are: Business Relationship Management and Supplier Management. Both new models are universal and their application could be in every type of the industry.

Keywords — ISO/IEC 20000, ITIL, Event Management, Demand Management, Service Portfolio Management, Service Validation and Testing, Business Relationship Management, Supplier Management.

I. INTRODUCTION

Since its emergence in 2005 year from 3GPP (Third Generation Partnership Project), IP Multimedia Subsystem (IMS) became standardized architecture for providing circuit switched and packet switched services on one integrated, total and summarized solution. Today many Telecom operators are implementing, if they have not already implemented it, IMS system to coordinate many overlapping services from different architectures to one

Manuscript received September 28, 2012: Revised version received November 27, 2012.

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integrated solution. IMS system uses a group of standardized protocols (basis is SIP protocol), whether they are from circuit switched networks or packet switched networks, to offer many services to its customers and to integrate mobile networks, internet and fixed telephony networks with reduced operating costs of the whole architecture and with ease of billing, charging and user authentification and authorization [R].

Information Technology Infrastructure Library (ITIL) represents the basis for many standards and it is the most used methodology for implementing and management of IT services independent of the type of organization [6], [7], [8]. ITIL V3 vas introduced in 2007 year and was revised in 2011 year. It consists of 5 phases with 26 IT processes and 4 IT functions [9], [10]. Reason why 4 functions are not covered in this paper, is that functions refer to the logical grouping of roles and automated measures that execute defined process, an activity or combination of both [11],[12].

ISO/IEC 20000 Edition 2 is standard, so its improvement can not be done through comparative analysis of IT functions and as a standard it is independent of any kind of function and organization.

Implementation of IMS system through ITIL V3 recommendations is taken through concretization of Key Performance Indicators (KPIs) and Key activities of every process of ITIL V3 framework. ISO/IEC 20000 Edition 1 was first published by the International Organization for Standardization (ISO) and International Electrotechnical Commission (IEC) on 15th December 2005. ISO/IEC 20000:2005 is the first worldwide quality standard specifically aimed at IT support and maintenance organizations [13]. It describes an integrated set of processes and management approach for the effective delivery of IT services to the internal or external customer [13]. Current version of standard is ISO/IEC 20000:2011 Edition 2 and it consists of two parts. Part 1 is called „Specification" and it is published as ISO/IEC 20000-1. This part of standard is also called „SHALLS" and it provides the minimum requirements for a mature IT Service Management (ITSM) function and is relevant to those responsible for implementing, maintaining or auditing on ITSM [13]. Part 2 is called „Code of Practice" and it is published as ISO/IEC 20000-2. This part of standard is also called „SHOULD" and represents an industry consensus on guidance to auditors and assistance to IT organizations planning service improvements or to be audited against ISO/IEC 20000-1 [13]. Where the rules of part 1 are mandatory ('Shalls') to achieve certification, the rules of part 2 are guidelines ('Shoulds') on implementing

ITSM and should therefore be read in conjunction with ISO/IEC 20000-1 [13]. In this paper section 3 describes results of comparative analysis of implementation of IMS system through ITIL V3 recommendations and ISO/IEC 20000 Edition 2 standard and proposes new improved lifecycle of IT services in ISO/IEC 20000 Edition 2 standard. Improved model of new lifecycle of IT services in ISO/IEC 20000 Edition 2 standard is shown in section 4.

Section II of the paper describes previous research which is done in this scientific field. Section III of the paper describes results of comparative analysis between ITIL V3 and ISO/IEC 20000 Edition 2 frameworks in the implementation of IMS system. Section IV of the paper describes the design and implementation of a new model for ITIL 2011 framework which is the result of comparison with ISO/IEC 20000 standard. Finally, conclusion of the paper gives an improved lifecycle of IT services of ISO/IEC 20000 Edition 2 standard, benefits of new processes which are integrated into a new model of ITIL 2011 framework and the description of the future work of authors in this area.

II. PREVIOUS RESEARCH

Very interesting paper similar to this paper is [1] in which authors have concluded that tools and standards that are in included in IT Service Management systems are not comprehensive enough to serve as efficient management system. This paper reviews two established frameworks ITIL, COBIT and a standard, ISO/IEC 27002 focusing on their similarities and differences. It then proposes a comprehensive framework by integrating these three general frameworks and standards into an IT framework that could be used in every company.

In paper [2], authors have proposed a new maturity model to assess an ITIL implementation and provide a roadmap for improvement based on priorities, dependencies, and guidelines. They have demonstrated a practical application of the proposed model with a questionnaire to assess the ITIL Incident Management process that was evaluated in two real-world organizations. Very interesting paper is also [3] in which the design and implementation of IMS system has been done by using ITIL V3 recommendations. Results of this implemented system have shown that the percentage of the successful implemented IMS tests by using ITIL V3 recommendations is 98%. This result shows that the implemented IMS model is suitable for the release into a production. Paper [4] describes differences between these ITIL 2007 and ITIL 2011 in the implementation of the IP Multimedia Subsystem (IMS system) in one Telecom Operator in Bosnia and Herzegovina. The result of the paper is also a set of suggestions for the future ITIL V3 improvement. Finally, paper [5] has showed that as IT service providers are adopting more comprehensive approaches towards IT service management (ITSM), they increasingly need to rely on ITSM software solutions in their day-to-day operations. Without any standardized information model for ITSM processes, efficient and integrated ITSM will remain a vision. While in the telecommunications sector, a lot of work has been invested into developing the shared information/data model (SID), a

companion model for the industry-specific process framework enhanced telecom operations map (eTOM), no equivalent for the more general process frameworks of ITIL and ISO/IEC 20000 is in sight. This paper introduces an approach towards an information model for ITSM processes. The presented method leverages work done for SID, by adapting and complementing SID concepts and content to produce an information model compliant to ISO/IEC 20000 requirements and ITIL recommendations. This paper is the introduction into research covered in this paper. The research covered is the continuous of previous research papers in improvement of actual version of ITIL, but also the first paper which gives a new model of ITIL framework from ISO/IEC 20000 standard.

III. RESEARCH METHODOLOGY AND RESULTS

This section describes the results of comparative analysis taken through implementation of IMS system with ITIL V3 recommendations and ISO/IEC 20000 Edition 2 recommendations. Improvements that are identified through comparative analysis are represented through 4 new processes. Those 4 new processes represent the results of comparative analysis (similarities and differences) of ITIL V3 and ISO/IEC 20000 Edition 2 recommendations and identification of missing and needed steps through implementation of IMS system with ISO/IEC 20000 Edition 2 lifecycle of IT services [R]. 4 new processes that are identified as improvement are :

- Event Management process
- Demand Management process
- Service Portfolio Management process
- Service Validation and Testing Management process

Overall procedure that led us to those 4 new processes consists of comparison of implementation of IMS system through Key activities and Key Performance Indicators for each process inside ITIL V3 framework and ISO/IEC 20000 Edition 2 standard. After comparison of implementation of IMS system we approached to comparison of similarities, differences, advantages and disadvantages of ITIL V3 framework and ISO/IEC 20000 Edition 2 standard [6], [7], [8], [9], [10], [12]. Inside the comparison of implementation of IMS system those parameters led us to identification of missing elements that were key to quality and performance improvement of IT services and reduction of unnecessary operating, implementation and management costs and resource usage. Key Performance Indicators, Key activities and Critical Success Factors for all 4 new processes are shown in [7], [8], [9], [10], [12].

Event Management process

Reason why this process is identified as improvement is that events are prioritized, categorized and assessed in early stage of its occurence. This assure that quality and performance that is defined in SLA,OLA and UC agreements is achieved and this proactive process assure that events are assessed before they use unnecessary resources of problem or incident management processes. Events can sometimes represent monitoring so they do not

belong to any responsible processes except Event management so additional resources of other processes are not wasted. Figure 1. represents Event management process with its interfaces to other processes in ISO/IEC 20000 Edition 2 standard.
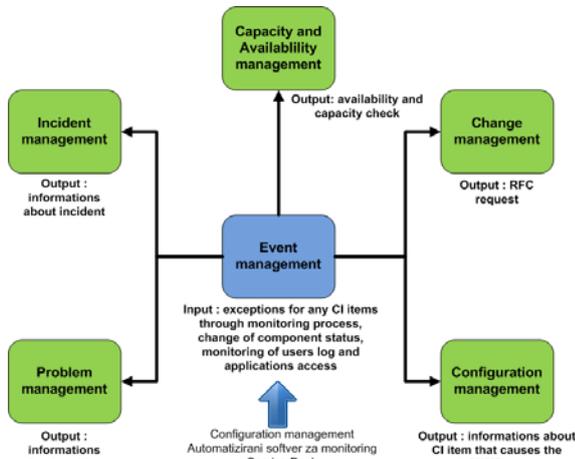

Figure 1. Event Management process interfaces

Demand Management process

Demand management process represents first point of touch of user requirements and service providers ability to response to those requirements. This process creates Pattern of Business Activity (PBAs) that represents user business activity and it assign corresponding Demand pattern that further creates 3 types of packets (Core service, Service level and Lines of service packets). Those packets are further detailed in Service Catalogue and Service Portfolio Management processes. This new process approves financial investment in new services and it resolves problems for Financial management and Service Portfolio Management processes. Figure 2. represents Demand management process with its interfaces to other processes in ISO/IEC 20000 Edition 2 standard.
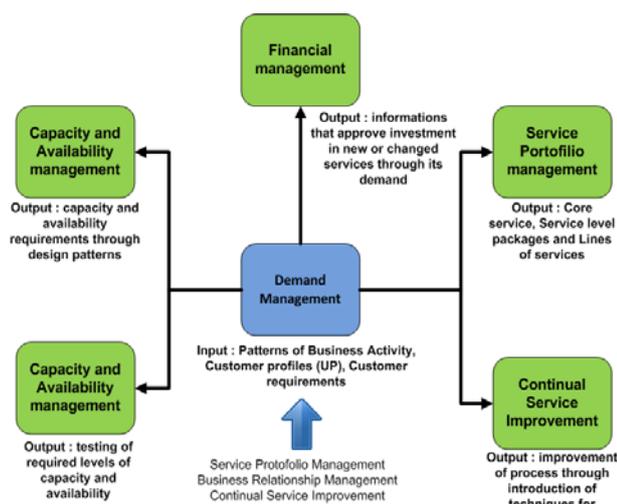

Figure 2. Demand Management process interfaces

Service Portfolio process

This new process is introduced to fill the gap created by introduced Demand Management process and existing Catalogue Management process. This process further examine 3 types of packets created in Demand Management process and create basis needed for Catalogue Management process. This process financially approves new future-proof services that will be shown to its customers through service catalogue. Figure 3. represents Service Portfolio management process with its interfaces to other processes in ISO/IEC 20000 Edition 2 standard.

Figure 3. Service Portfolio Management process interfaces

Service Validation and Testing Management process

This process is now singled out as a new process and it is partially covered in section 9 of ISO/IEC 20000-1 specification. Reasons for additional testing of services are assuring quality and performances of services, reducing number of incident and problems, easier identification of problems and incidents, less calls to support teams, reduced operational costs and maintenance costs, effective and efficient usage of other process resources. Figure 4. represents Service Validation and Testing management process with its interfaces to other processes in ISO/IEC 20000 Edition 2 standard.
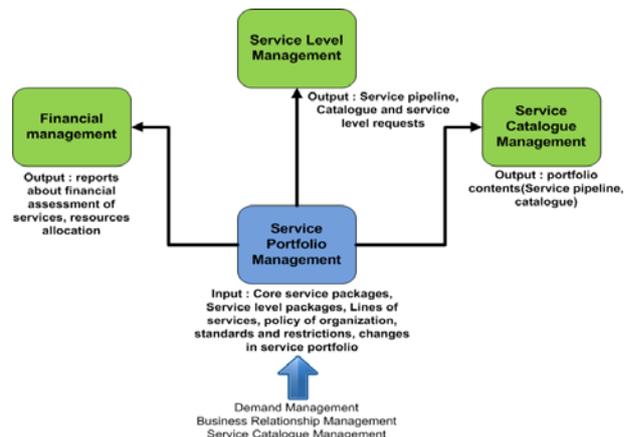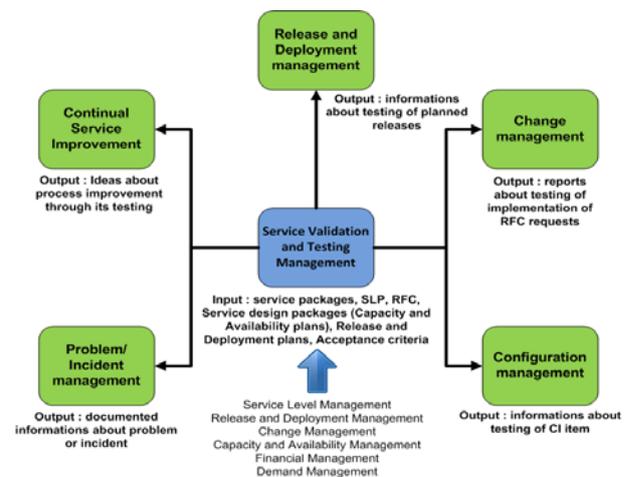

Figure 4. Service Validation and Testing Management process interfaces

IV. THE DESIGN AND IMPLEMENTATION OF A NEW MODEL OF ITIL 2011 FRAMEWORK

ISO/IEC 20000 has even twelve complementary processes with ITIL 2011 framework. Two processes from ISO/IEC 20000 are the result of the synthesis of two ITIL processes: Service Continuity and Availability management process and Incident and Service Request Management. Other complementary processes are: Service Level Management, Budgeting and Accounting for services, Capacity Management, Information Security Management, Business Relationship Management, Supplier Management, Problem Management, Configuration Management, Change Management and Release and Deployment Management. Figure 5. presents complementary processes from ISO/IEC 20000 standard with processes of ITIL 2011 framework (processes in ITIL 2011 model are signed with red colour). Table I. shows a display of complementary processes of ISO/IEC 20000 standard with processes of ITIL 2011 framework.

TABLE I. TABLE DISPLAY OF COMPLEMENTARY PROCESSES OF ISO/IEC 20000 STANDARD WITH PROCESSES OF ITIL 2011 FRAMEWORK

The name of ITIL 2011 process	The name of complementary ISO/IEC 20000 process
Financial Management for IT services	Budgeting & Accounting for services
Business Relationship Management	Business Relationship Management
Service Level Management	Service Level Management
Capacity Management	Capacity Management
Availability Management	Service Continuity & Availability Management
IT Service Continuity Management	Service Continuity & Availability Management
Information Security Management	Information Security Management
Supplier Management	Supplier Management
Change Management	Change Management
Service Asset and Configuration Management	Configuration Management
Release and Deployment Management	Release and Deployment Management
Incident Management	Incident and Service Request Management
Service Request	Incident and Service Request Management
Problem Management	Problem Management

Table II. shows complementary processes of ISO/IEC 20000 standard which have achieved satisfactory results in the measurement of key activities during the implementation of the IMS system. In total, nine of the twelve processes from ISO/IEC 20000 standard have achieved positive results of measurements of their key activities: Budgeting & Accounting for services, Business Relationship Management, Service Level Management, Capacity Management, Service Continuity & Availability Management, Supplier Management, Change Management, Configuration Management and finally Release and Deployment Management process. Only Information Security Management process, Incident and Service Request Management process and Problem Management process have not achieved satisfactory results in the measurement of key activities.

TABLE II. ISO/IEC 20000 PROCESSES WHICH CAN BE USED IN COMPARATIVE ANALYSIS WITH ITIL PROCESSES

The name of ISO/IEC 20000 process which can be used in comparative analysis	The result of the measurement during the implementation of some ISO/IEC 20000 process
Budgeting & Accounting for services	84.56%
Business Relationship Management	75.16%
Service Level Management	90.51%
Capacity Management	88.01%
Service Continuity & Availability Management	87.15%
Supplier Management	82.37%
Change Management	89.45%
Configuration Management	89.00%
Release and Deployment Management	91.08%

Table III. shows results of the implementation of processes of ITIL 2011 framework during the implementation of IP Multimedia Subsystem. The total number of ITIL 2011 processes which have not achieved good results is eight. These are the processes which the result of the implementation of key activities is less than 75%: Strategy Management for IT services which is responsible for translating business needs into IT requirements, Business Relationship Management which is responsible for the management of IT processes and relationships, Information Security Management which is responsible for establishing and design of Information Security Management system, Supplier Management which is responsible for managing relationships with extern companies, Knowledge Management which is responsible for teaching users and employees, Event Management which is responsible for the categorization of events on incidents and problems, Incident Management which is responsible for solving incidents and Problem Management which is responsible for solving problems. The aim of this comparison is to perform the current ITIL process model by adding new processes which have achieved positive results of measurements from ISO/IEC 20000 standard.

TABLE III. RESULTS OF THE IMPLEMENTATION OF PROCESSES FROM ITIL 2011 FRAMEWORK

ITIL process name	The average percentage of ITIL process implementation
Strategy Management for IT services	65.03%
Financial Management for IT services	87.80%
Demand Management	83.75%
Service Portfolio Management	75.36%
Business Relationship Management	55.95%
Design Coordination	82.51%
Service Catalogue Management	77.19%
Service Level Management	89.50%
Capacity Management	80.78%
Availability Management	93.36%
IT Service Continuity Management	87.92%
Information Security Management	59.69%
Supplier Management	66.65%
Transition Planning and Support	82.90%
Change Management	86.87%

Service Asset and Configuration Mng	86.38%	
Release and Deployment Mng	92.56%	
Service Validation and Testing	94.14%	
Change Evaluation	91.34%	
Knowledge Management	61.86%	
Event Management	61.72%	
Incident Management	52.91%	
Request Fulfillment	94.00%	
Problem Management	64.80%	
Access Management	79.16%	
7-Step CSI Process	81.79%	

Mapping processes from table II. and table III., we can come to the conclusion that there are two ISO/IEC 20000 processes that can be used to replace the corresponding ITIL processes. These processes are Business Relationship Management which is responsible for the management of organisation relationships and processes and Supplier Management which is responsible for the management of relationships with extern companies. Simple math shows that it is possible to create three new models of ITIL 2011 framework by adding these three new processes into the ITIL 2011 process model. Tables IV., V. and VI. present new ITIL models which have just a new Business Relationship Management process, just a new Supplier Management process and the combination of Business Relationship Management process and Supplier Management process.

TABLE IV. THE NEW PROCESS MODEL 1. OF ITIL 2011 FRAMEWORK WHICH IS THE RESULT OF THE COMPARISON WITH ISO/IEC 20000 STANDARD

The name of ITIL 2011 phase	The name of ITIL process	The new process which is the result of comparative analysis with ISO/IEC 20000 standard
Service Strategy	Strategy Management for IT services	NO
Service Strategy	Financial Management for IT services	NO
Service Strategy	Demand Management	NO
Service Strategy	Service Portfolio Management	NO
Service Strategy	Business Relationship Mng	YES
Service Design	Design Coordination	NO
Service Design	Service Catalogue Management	NO
Service Design	Service Level Management	NO
Service Design	Capacity Management	NO
Service Design	Availability Management	NO
Service Design	IT Service Continuty Management	NO
Service Design	Information Security Management	NO
Service Design	Supplier Management	NO
Service Transition	Transition Planning and Support	NO
Service Transition	Change Management	NO
Service Transition	Service Asset and Configuration Mng	NO
Service Transition	Release and Deployment Mng	NO
Service Transition	Service Validation and Testing	NO
Service Transition	Change Evaluation	NO

TABLE V. THE NEW PROCESS MODEL 2. OF ITIL 2011 FRAMEWORK WHICH IS THE RESULT OF THE COMPARISON WITH ISO/IEC 20000 STANDARD

The name of ITIL 2011 phase	The name of ITIL process	The new process which is the result of comparative analysis with ISO/IEC 20000 standard
Service Strategy	Strategy Management for IT services	NO
Service Strategy	Financial Management for IT services	NO
Service Strategy	Demand Management	NO
Service Strategy	Service Portfolio Management	NO
Service Strategy	Business Relationship Mng	NO
Service Design	Design Coordination	NO
Service Design	Service Catalogue Management	NO
Service Design	Service Level Management	NO
Service Design	Capacity Management	NO
Service Design	Availability Management	NO
Service Design	IT Service Continuty Management	NO
Service Design	Information Security Management	NO
Service Design	Supplier Management	YES
Service Transition	Transition Planning and Support	NO
Service Transition	Change Management	NO
Service Transition	Service Asset and Configuration Mng	NO
Service Transition	Release and Deployment Mng	NO
Service Transition	Service Validation and Testing	NO
Service Transition	Change Evaluation	NO
Service Transition	Knowledge Management	NO
Service Operation	Event Management	NO
Service Operation	Incident Management	NO
Service Operation	Request Fulfillment	NO
Service Operation	Problem Management	NO
Service Operation	Access Management	NO
Continual Service Improvement	7-Step CSI Process	NO

(Table continued from top-right column:)

Service Transition	Knowledge Management	NO
Service Operation	Event Management	NO
Service Operation	Incident Management	NO
Service Operation	Request Fulfillment	NO
Service Operation	Problem Management	NO
Service Operation	Access Management	NO
Continual Service Improvement	7-Step CSI Process	NO

TABLE VI. THE NEW PROCESS MODEL 3. OF ITIL 2011 FRAMEWORK WHICH IS THE RESULT OF THE COMPARISON WITH ISO/IEC 20000 STANDARD

The name of ITIL 2011 phase	The name of ITIL process	The new process which is the result of comparative analysis with ISO/IEC 20000 standard
Service Strategy	Strategy Management for IT services	NO
Service Strategy	Financial Management for IT services	NO
Service Strategy	Demand Management	NO
Service Strategy	Service Portfolio	NO

	Management	
Service Strategy	Business Relationship Mng	YES
Service Design	Design Coordination	NO
Service Design	Service Catalogue Management	NO
Service Design	Service Level Management	NO
Service Design	Capacity Management	NO
Service Design	Availability Management	NO
Service Design	IT Service Continuty Management	NO
Service Design	Information Security Management	NO
Service Design	Supplier Management	YES
Service Transition	Transition Planning and Support	NO
Service Transition	Change Management	NO
Service Transition	Service Asset and Configuration Mng	NO
Service Transition	Release and Deployment Mng	NO
Service Transition	Service Validation and Testing	NO
Service Transition	Change Evaluation	NO
Service Transition	Knowledge Management	NO
Service Operation	Event Management	NO
Service Operation	Incident Management	NO
Service Operation	Request Fulfillment	NO
Service Operation	Problem Management	NO
Service Operation	Access Management	NO
Continual Service Improvement	7-Step CSI Process	NO

Tables VII., VIII. and IX. present results of three new models of ITIL 2011 framework in all four functions of ITIL: Technical Management, Application Management, Service Desk and IT Operations Management. The new model 1. has a new process Business Relationship Management and good results of this model are achieved in Service Desk function and IT Operations Management function (figure 6.). The new model 2. has a new process Supplier Management and good results of this model are achieved in all four ITIL functions. The new model 3. has two new processes: Business Relationship Management and Supplier Management and good results of this model are achieved in Service Desk function and IT Operations Management function at Business Relationship Management process and in all four functions at Supplier Management process (figure 6.).

TABLE VII. RESULTS OF THE IMPLEMENTATION OF THE NEW MODEL 1. OF ITIL 2011 FRAMEWORK

The name of ITIL process	TM	AM	SD	ITOPM
Strategy Management for IT services	53.55%	68.67%	67.61%	70.00%
Financial Management for IT services	87.74%	88.68%	90.80%	84.04%
Demand Management	87.15%	82.36%	83.00%	82.50%
Service Portfolio Management	79.50%	86.71%	75.72%	59.53%
Business Relationship Mng	73.62%	67.48%	81.07%	76.58%

Design Coordination	77.57%	84.30%	84.12%	84.05%
Service Catalogue Management	75.42%	83.55%	72.14%	76.12%
Service Level Management	83.88%	92.14%	92.68%	89.31%
Capacity Management	74.93%	79.61%	85.81%	82.78%
Availability Management	86.29%	91.15%	97.30%	98.71%
IT Service Continuty Management	91.73%	93.50%	77.13%	89.33%
Information Security Management	62.43%	69.15%	60.56%	73.24%
Supplier Management	70.63%	63.86%	74.13%	58.00%
Transition Planning and Support	81.59%	86.85%	81.13%	82.05%
Change Management	80.03%	93.75%	91.75%	81.95%
Service Asset and Configuration Mng	91.00%	83.38%	91.33%	79.82%
Release and Deployment Mng	91.27%	97.50%	88.80%	92.70%
Service Validation and Testing	92.37%	95.38%	94.20%	94.64%
Change Evaluation	97.72%	98.30%	79.70%	89.66%
Knowledge Management	68.39%	57.88%	64.06%	56.20%
Event Management	60.41%	64.12%	65.52%	70.12%
Incident Management	56.21%	37.95%	63.68%	53.80%
Request Fulfillment	96.52%	97.94%	91.14%	90.42%
Problem Management	67.82%	53.04%	70.86%	67.50%
Access Management	75.60%	69.43%	84.96%	86.67%
7-Step CSI Process	85.12%	87.08%	80.44%	79.15%

TABLE VIII. RESULTS OF THE IMPLEMENTATION OF THE NEW MODEL 2. OF ITIL 2011 FRAMEWORK

The name of ITIL process	TM	AM	SD	ITOPM
Strategy Management for IT services	53.55%	68.67%	67.61%	70.00%
Financial Management for IT services	87.74%	88.68%	90.80%	84.04%
Demand Management	87.15%	82.36%	83.00%	82.50%
Service Portfolio Management	79.50%	86.71%	75.72%	59.53%
Business Relationship Mng	52.80%	45.00%	68.50%	57.50%
Design Coordination	77.57%	84.30%	84.12%	84.05%
Service Catalogue Management	76.07%	94.50%	54.40%	83.81%
Service Level Management	83.88%	92.14%	92.68%	89.31%
Capacity Management	74.93%	79.61%	85.81%	82.78%
Availability Management	86.29%	91.15%	97.30%	98.71%
IT Service Continuty Management	91.73%	93.50%	77.13%	89.33%
Information Security	55.00%	61.55%	52.79%	69.43%

Management		%	%	
Supplier Management	81.12%	80.69 %	81.15 %	80.00%
Transition Planning and Support	81.59%	86.85 %	81.13 %	82.05%
Change Management	80.03%	93.75 %	91.75 %	81.95%
Service Asset and Configuration Mng	91.00%	83.38 %	91.33 %	79.82%
Release and Deployment Mng	91.27%	97.50 %	88.80 %	92.70%
Service Validation and Testing	92.37%	95.38 %	94.20 %	94.64%
Change Evaluation	97.72%	98.30 %	79.70 %	89.66%
Knowledge Management	68.39%	57.88 %	64.06 %	56.20%
Event Management	57.69%	66.87 %	56.00 %	66.33%
Incident Management	56.21%	37.95 %	63.68 %	53.80%
Request Fulfillment	96.52%	97.94 %	91.14 %	90.42%
Problem Management	67.82%	53.04 %	70.86 %	67.50%
Access Management	75.60%	69.43 %	84.96 %	86.67%
7-Step CSI Process	84.60%	87.05 %	78.20 %	77.31%

TABLE IX. RESULTS OF THE IMPLEMENTATION OF THE NEW MODEL 3. OF ITIL 2011 FRAMEWORK

The name of ITIL process	TM	AM	SD	ITOP M
Strategy Management for IT services	53.55%	68.67 %	67.61 %	70.00%
Financial Management for IT services	87.74%	88.68 %	90.80 %	84.04%
Demand Management	87.15%	82.36 %	83.00 %	82.50%
Service Portfolio Management	79.50%	86.71 %	75.72 %	59.53%
Business Relationship Mng	73.62%	67.48 %	81.07 %	76.58%
Design Coordination	77.57%	84.30 %	84.12 %	84.05%
Service Catalogue Management	75.42%	83.55 %	72.14 %	76.12%
Service Level Management	83.88%	92.14 %	92.68 %	89.31%
Capacity Management	74.93%	79.61 %	85.81 %	82.78%
Availability Management	86.29%	91.15 %	97.30 %	98.71%
IT Service Continuty Management	91.73%	93.50 %	77.13 %	89.33%
Information Security Management	62.43%	69.15 %	60.56 %	73.24%
Supplier Management	81.12%	80.69 %	81.15 %	80.00%
Transition Planning and Support	81.59%	86.85 %	81.13 %	82.05%
Change Management	80.03%	93.75 %	91.75 %	81.95%
Service Asset and Configuration Mng	91.00%	83.38 %	91.33 %	79.82%
Release and Deployment Mng	91.27%	97.50 %	88.80 %	92.70%
Service Validation and Testing	92.37%	95.38 %	94.20 %	94.64%
Change Evaluation	97.72%	98.30	79.70	89.66%

Knowledge Management	68.39%	57.88 %	64.06 %	56.20%
Event Management	60.41%	64.12 %	65.52 %	70.12%
Incident Management	56.21%	37.95 %	63.68 %	53.80%
Request Fulfillment	96.52%	97.94 %	91.14 %	90.42%
Problem Management	67.82%	53.04 %	70.86 %	67.50%
Access Management	75.60%	69.43 %	84.96 %	86.67%
7-Step CSI Process	85.12%	87.08 %	80.44 %	79.15%

Both processes which are taken from ISO/IEC 20000 standard: Business Relationship Management and Supplier Management have achieved better results than the old same processes. Business Relationship Management has achieved better results of the implementation in all four functions, especially for the Service Desk function and for the IT Operations Management function in which results are positive. Supplier Management has achieved positive results of the implementation in all four ITIL functions. The new model of ITIL framework has two new processes: Business Relationship Management process which is responsible for the management with IT processes and relationships and Supplier Management process which is responsible for the categorization, prioritisation and solving tasks in collaboration with extern companies. Figure 6. shows a new model of ITIL 2011 framework which is the result of the comparison with ISO/IEC 20000 standard.

V. CONCLUSION

Results presented in section 3 shows next benefits of new improved lifecycle of IT services of ISO/IEC 20000 Edition 2 standard :

- Scope of appliance of standard does not reduce
- Scope of appliance of standard is broaden with 4 new introduced processes and it completes all objecitves set by standard
- Reduced number of steps needed to identify wrong operation of services
- Additional testing reduces operational costs of unidentified problems, incidents
- Additional financial approvement of future-proof services through Demand and Portfolio Management processes
- Enhanced compatibility of standard with ITIL V3 framework and other standards
- Reactive becomes proactive with Event management process and additional testing
- Reduced redundant steps of problem or incident identification with reduced resource usage of other processes
- Additional interfaces between processes increase possibility and ability of existing and new processes.

Figure 7. represents new improved lifecycle of IT services of ISO/IEC 20000 Edition 2 standard with 4 new processes and assigned phases. The advantages of the new

implemented Business Relationship Management process are:

- Advances in network scale, scope, and sophistication
- Constant disruption as the 'new normal' business dynamic
- Decentralization of knowledge and the devaluation of traditional IP
- Increased openness of networked knowledge
- Decline of command and control management.

The advantages of the new implemented Supplier Management process are:

- Working with business leaders who have identified a business need or requirement to identify, source, contract, and procure the needed good or service from qualified suppliers
- Managing supplier performance
- Implementing technologies, processes, policies, and procedures to support the purchasing process
- The supplier relationship management process: a process for providing the structure for how relationships with suppliers will be developed and maintained
- Economic theories of supply and demand.

The new model of ITIL 2011 framework has achieved better results for two processes: Business Relationship Management and Supplier Management. This new ITIL model doesn't achieve good results in rest six processes the same as after the first measurement. The improvement of the existing process model of ITIL 2011 framework has been done in two of eight processes (the successful rate of the improvement is 25%). This paper is the part of the project on which are doing the authors of this paper on Faculty of Electrical Engineering, University of Sarajevo. The aim is to improve the current model of ITIL 2011 framework by using comparisons with five other IT Service Management frameworks and standards: CobiT, eTOM, PRINCE2, ISO/IEC 20000 and ISO/IEC 27000. The project has been done in the test environment of IPTV/VoIP system in one Telecom operator in Bosnia and Herzegovina and the result of this project will be published on one of next conferences or journals.

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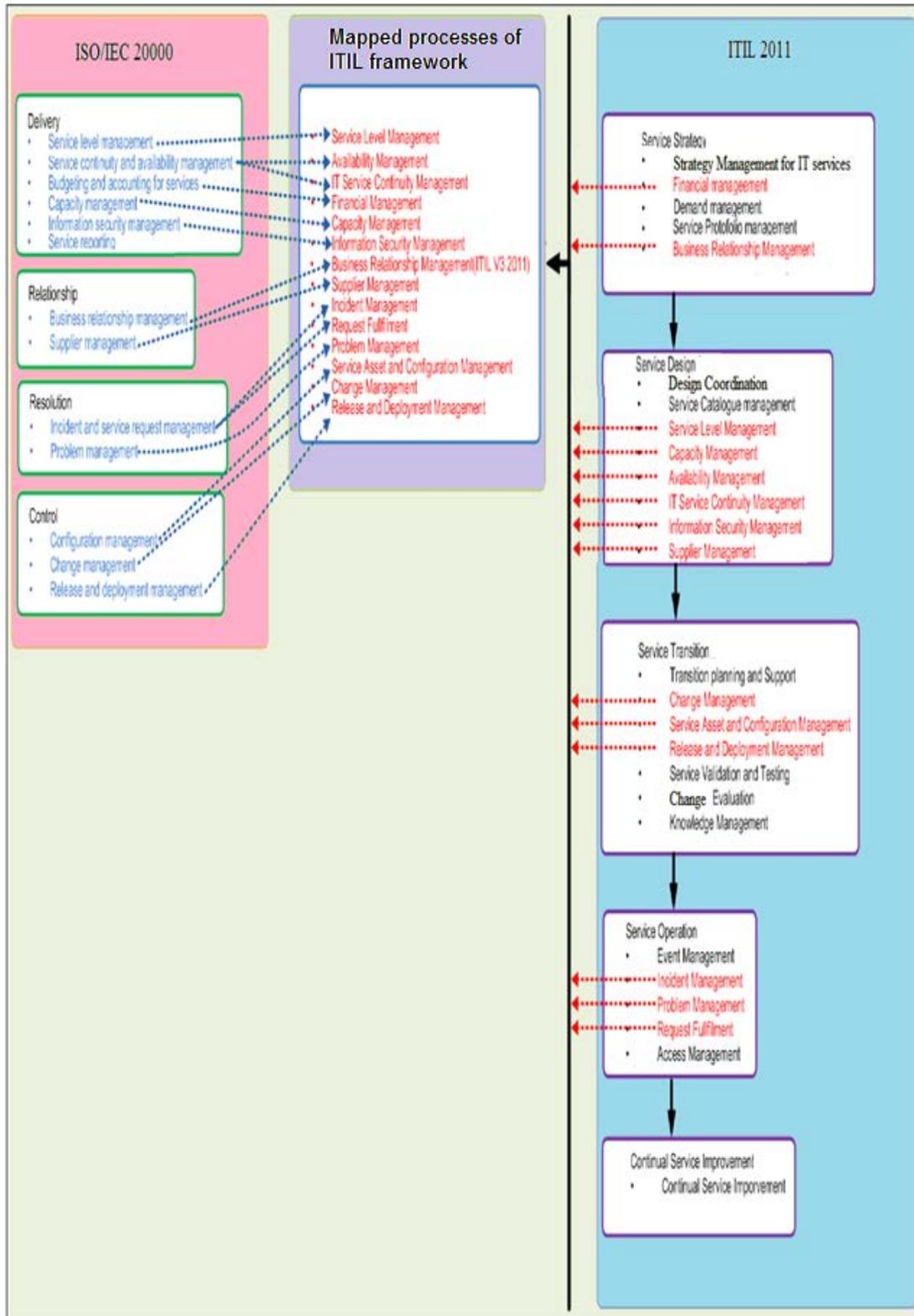
Figure 5. Complementary processes of ISO/IEC 20000 standard with processes of ITIL 2011 framework

ITIL 2011

Service Strategy

Strategy Management for IT services
Financial Management for IT services
Demand Management
Service Portfolio Management
Business Relationship Management

Service Design

Design Coordination
Service Catalogue Management
Service Level Management
Capacity Management
Availability Management
IT Service Continuity Management
Information Security Management
Supplier Management

Service Transition

Transition Planning and Support
Change Management
Service Asset and Configuration Management
Release and Deployment Management
Service Validation and Testing
Change Evaluation
Knowledge Management

Service Operation

Event Management
Incident Management
Request Fulfillment
Problem Management
Access Management

Continual Service Improvement

7-Step Continual Service Improvement Process

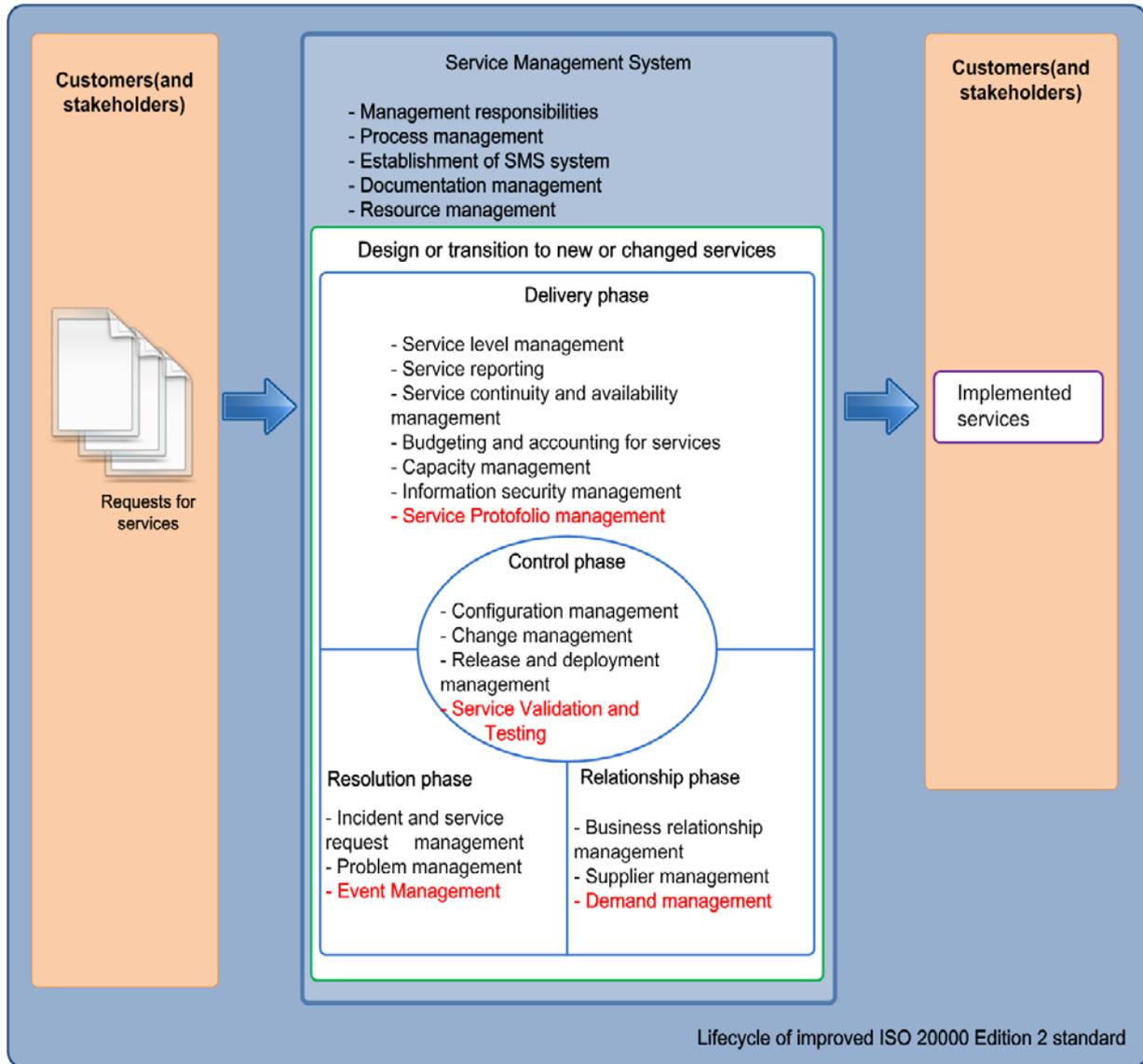Figure 6. New model for ITIL 2011 framework

Figure 7. Improved lifecycle of IT services of ISO/IEC 20000 Edition 2 standard