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Improvement of the Etom Standard Throught the Comparison with Itil V3 Best Practices

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Abstract: Managing IT servers is becoming one of the most interesting topics in today's business. Many standards exists which define the management in an IT organization, IT servers or IT projects. eTOM represents a most commonly adopted standard for management over IT servers in telecommunication industry, where ITIL is generally the most adopted standard which is used in almost every industry. Most of the Telecom operators use the eTOM standards regarding the fact that it is specialized for telecommunication industry. The goal of this work is to suggest the new improved eTOM standard which is going to consist of all components that ITIL V3 has, but which the current eTOM standard doesn't have. The investigation has been made in two Telecom operators in Bosnia and Herzegovina. In the first Telecom operator the processes are arranged according to the eTOM standards and in the second Telecom operator the processes are arranged according to the ITIL V3 best practises. Both telecom operators are providing classical Internet services like Internet, IPTV, VoIP, E-mail and Hosting and the teams responsible for these functions are identical. The new improved eTOM standard includes all teams which contain ITIL V3 and do not include the existing eTOM standard.

Key words: Information Technology Infrastructure Library · Enhanced Telecom Operations Map

INTRODUCTION

Managing the IT servers, processes or projects is becoming a challenge for every IT manager [1]. The task of an IT manager is to specify and implement one of the IT Service Management standards in their department, respectively their organization. Today the best know standards for IT Service Management are: ITIL, eTOM, COBIT, PRINCE2 and LearnIT [1-10].

ITIL V3 (Information Technology Infrastructure Library Version 3) represents the most famous collection of best practises for managing IT servers in any organization. There are altogether 5 phases: Service Strategy [2], Service Design [3], Service Transition [4], Service Operation [5] and Continual Service Improvement [6] which includes altogether 23 processes and 4 functions. ITIL V3 can be applied in every industry including the Telecom industry.

eTOM (enhanced Telecom Operations Map) is the most famous standard for managing IT services in Telecommunication industry [7, 8, 9]. It consists of 3 phases: strategic, operational and management which together have 15 processes. eTOM is standard which is specialized in telecommunication industry, although in recent time it as a wider span of application.

The goal of this document is to improve the existing eTOM standard in the Telecom industry and to do that through a comparison with the ITIL V3 best practises and that on two examples of Telecom operators in Bosnia and Herzegovina. In the first Telecom operator the processes are organized according to the eTOM standard and in the second according to ITIL V3 best practises. The document is comparing the implementation of two standards and after that it takes the advantages of ITIL V3 best practises implementation which the current eTOM standard doesn't have and as a suggestion, presents the new improved eTOM standard which at the same time is a kind of a conclusion of this work. The improved eTOM standard as a result should produce new teams which are going to help in the design of business processes of the Telecom operator.

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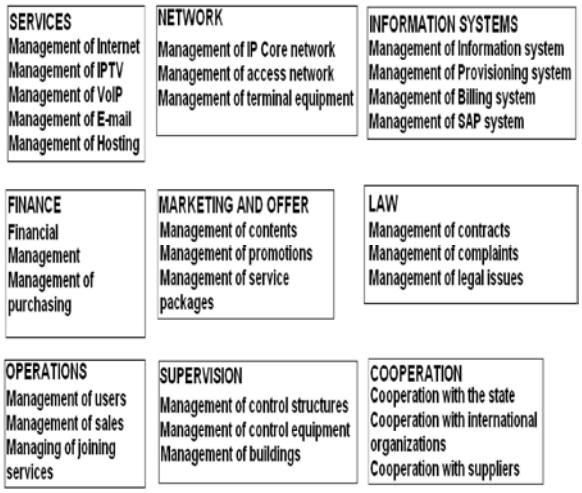

Fig. 1: Functional units of the Telecom operator which must be defined by each IT management standard

The first chapter of the work describes the implementation of the first Telecom operator in regard to the ITIL V3 best practises. The second chapter describes the implementation of the second Telecom operator according to the eTOM standard. The third chapter of the work is about the comparison of the implementation of two standards and as a result provides a new improved eTOM standard. In the conclusion of the work are presented eventual improvements which may be achieved from the implementation of the new recommended eTOM standard.

In the previously published works of authors from this same field and which represent an introduction in this research, are: [11, 12, 13]. In these papers are presented: the implementation of ITIL V3 recommendations in information system of Telecom Operator, comparative analysis about the implementation of Supplier Management in information system of Telecom Operator and the analysis about the implementation of the Information Security Management in IPTV/VoIP system. Results about the implementation of ITIL V3 best practices are presented in this paper.

These Telecom operators offer customers all Internet services: Internet, IPTV, VoIP, E-mail and Hosting. Figure 1 shows the building elements of a Telecom operator where the management of all units has to be defined. Functional units which have to have a defined management through some IT management standard are: servers, networks, information systems, finances, law, marketing and sales, standard operations, surveillance and cooperation with other Telecom operators. All functioning units have to be connected so that they enable the delivery of a service to the end user with a high standard. Every functional unit of the Telecom operator has few defined managements [10].

Implementation of the Telecom Operator According to the Itil V3 Best Practises: Table 1 shows the implementation of the Telecom operator according to the ITIL V3 best practises [11, 13, 14].

Table 1: Teams in the implementation of the telecom operator according to the ITIL V3 best practises

Name of the ITIL V3 process or function	Name of the team in the realization of a certain ITIL V3 process	Number of people in each team
Financial Management	T1: Team for investment management	T1=6
	T2: Team for resource management	T2=6
	T3: Team for revenue management	T3=3
	T4: Team for the management of the overall finances	T4=4
	T5: Team for managing the expenditure of the Telecom operator	T5=4
Demand Management	T6: Team for managing consumer demands	T6=2
	T7: Team for managing the demands of other Telecom operators	T7=3
	T8: Team for managing relationships with other international organizations	T8=3
Service Portfolio Management	T9: Team for defining the services of the Telecom operator	T9=9
	T10: Team for managing the sales	T10=20
Service Catalogue Management	T11: Team for defining the contents for all services of the Telecom operator	T11=8
	T12: Team for defining the IT service catalog	T12=3
Service Level Management	T13: Team for managing contracts with end users	T13=5
	T14: Team for managing human resources in the company	T14=6
	T15: Team for managing contracts with foreign companies	T15=6
	T16: Team for solving public complaints and court trials	T16=25
Capacity Management	T17: Team for managing IP network space of the Telecom operator	T17=3
	T18: Team for managing the performance system	T18=2
	T19: Team for managing the capacity of network elements, switches and DSLAMs	T19=3
Availability Management	T20: Team for defining the availability plan	T20=3
IT Service Continuity Management	T21: Team for defining and surveilling the backup service	T21=8
	T22: Team for the implementation of the backup service	T22=8
Information Security Management	T23: Team for defining the levels of information security	T23=3
	T24: Team for defining administrational roles in the management of the Information system	T24=2

Table 1: Continued

Name of the ITIL V3 process or function	Name of the team in the realization of a certain ITIL V3 process	Number of people in each team
Supplier Management	T25: Team for setting tenders	T25=6
	T26: Team for defining juristic and economical services for the tender	T26=3
	T27: Team for defining professional circumstances for the tender	T27=6
	T28: Team for conducting the realization of the tender	T28=6
	T29: Team for managing the relationships with strategic partners	T29=7
Transition Planning and Support Change Management	T30: Team for planning the adaptation of new services and utilities	T30=4
	T31: Team for administrating network elements for managing the Internet	T31=3
	T32: Team for administrating network elements for managing the IPTV service	T32=5
	T33: Team for the administration and design application of the IPTV service	T33=6
	T34: Team for the administration of network elements for managing the VoIP service	T34=4
	T35: Team for the administration of network elements for managing the Hosting services	T35=3
	T36: Team for the administration of network elements for managing the E-Mail service	T36=2
	T37: Team for the administration of the Portal of the Telecom operator	T37=3
	T38: Team for the administration of the Monitoring service and network	T38=2
	T39: Team for the administration of the IP core network structure	T39=5
	T40: Team for the administration of the DSLAM network	T40=6
	T41: Team for the administration of terminal devices	T41=6
Service Asset and Configuration Management	T42: Team for the administration of midpoint application of the Information system	T42=4
	T43: Team for the administration of the Provisioning system	T43=5
	T44: Team for the administration of the Billing system	T44=5
	T45: Team for the administration of the SAP system	T45=3
	T46: Team for the administration of the IT system infrastructure	T46=3
	T47: Team for the implementation of the midpoint application of the Information system	T47=5
	T48: Team for the implementation of the Provisioning system	T48=4
	T49: Team for the implementation of the Billing system	T49=6
	T50: Team for the implementation of the SAP system	T50=3
	T51: Team for the implementation of the IT system infrastructure	T51=3
Release and Deployment Management	T52: Team for the development of applications on the network element for managing the Internet	T52=3
	T53: Team for the development of applications on the network element for managing the IPTV service	T53=3
	T54: Team for the development of applications intended for the end user on the IPTV service	T54=4
	T55: Team for the development of applications on the network element for managing the VoIP service	T55=3
	T56: Team for the development of applications on the network element for managing the Hosting service	T56=2
	T57: Team for the development of applications on the network element for managing the E-mail service	T57=2
	T58: Team for the development of applications on the Portal of the Telecom operator	T58=4
	T59: Team for the development of applications for the Monitoring service and network	T59=3
	T60: Team for the development of the IP core network infrastructure	T60=5
	T61: Team for the development of the DSLAM network infrastructure	T61=6
	T62: Team for the development of software on terminal devices	T62=6
Knowledge Management	T63: Team for the organization of professional workshops	T63=2
	T64: Team for professional and scientific education of the Telecom employees	T64=3
Event Management	T65: Team for the management of relations between organizational units of the Telecom operator	T65=3
	T66: Team for monitoring and managing the events of other Telecom operators	T66=3
Incident Management	T67: Team for solving incidents on the servers	T67=4
	T68: Team for solving the incidents on the DSLAM	T68=5
	T69: Team for solving incidents on terminal devices	T69=8
	T70: Team for solving incidents which occur in the Information and Billing system	T70=6
Request Fulfillment	T71: Team for managing the contents on the Portal	T71=4
	T72: Team for managing the requests of users over the Portal	T72=3
	T73: Team for direct management of user requests	T73=4
Problem Management	T74: Team for solving problems on services	T74=3
	T75: Team for solving problems on the IP core network	T75=2
	T76: Team for solving problems on the DSLAM	T76=3
	T77: Team for solving problems on the Information system, Provisioning system or Billing system	T77=3
Access Management	T78: Team for securing all objects of the Telecom operator	T78=6
	T79: Team for securing the server halls and network equipment	T79=5
	T80: Team for managing the security of human resources	T80=10

Table 1: Continued

Name of the ITIL V3 process or function	Name of the team in the realization of a certain ITIL V3 process	Number of people in each team
Service Desk	T81: Team for providing information and solutions to problems on the Internet service	T81=15
	T82: Team for providing information and solutions to problems on the IPTV service	T82=12
	T83: Team for providing information and solutions to problems on the VoIP service	T83=14
	T84: Team for providing information and solutions to problems on the Hosting service	T84=4
	T85: Team for providing information and solutions to problems on the E-mail service	T85=3
	T86: Team for solving problems on computers	T86=3
	T87: Team for providing information and solutions to problems about the Portal of the Telecom operator	T87=3
	T88: Team for providing information and solutions to problems about reporting services	T88=4
Technical Management	T89: Team for surveillance and monitoring of the core router	T89=3
	T90: Team for monitoring and the surveillance of the server of services of the Telecom operator	T90=4
	T91: Team for surveillance and monitoring of the system IT platform of the Telecom operator	T91=2
	T92: Team for surveillance and monitoring of the switches in the network	T92=5
	T93: Team for monitoring and surveillance of the DSLAMs	T93=6
	T94: Team for the surveillance and monitoring of terminal equipment of end users	T94=8
Application Management	T95: Team for surveillance of functions of the central application of the Information system	T95=3
	T96: Team for surveillance of applications of the Provisioning system	T96=2
	T97: Team for the surveillance of the Billing system	T97=4
	T98: Team for the surveillance of the applications of the SAP system	T98=2
	T99: Team for the surveillance of the Internet service	T99=4
	T100: Team for the surveillance of the IPTV service	T100=4
	T101: Team for the surveillance of the VoIP service	T101=3
	T102: Team for the surveillance of the E-mail service	T102=2
	T103: Team for the surveillance of the Hosting service	T103=2
	T104: Team for the surveillance of the Portal of the Telecom operator	T104=2
IT Operations Management Function	T105: Team for the surveillance of the power supply in the server halls	T105=4
	T106: Team for the surveillance of air conditioning in the server halls	T106=3
	T107: Team for managing the security employees	T107=4
Continual Service Improvement Process	T108: Team for monitoring the functional units of the Telecom operator	T108=6
	T109: Team for the development of existing processes	T109=5
	T110: Team for recommending new organizational structure for the Telecom operator	T110=7
Service Reporting	T111: Team for managing public relationships	T111=3
	T112: Team for designing final reports on the business of the Telecom operator	T112=6
	T113: Team for forecasting future business results of the Telecom operator	T113=4

Fig. 2: The number of employees by each ITIL V3 process in Telecom Operator

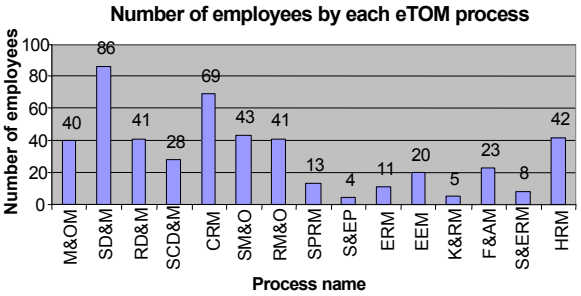

Fig. 3: The number of employees in the Telecom Operator by using eTOM standard

Figure 2 shows the number of employees for each ITIL V3 process. As we can see from figure 2., the process (the function) with the biggest number of employees is Service Desk and the process with the smallest number of employees is Availability Management. Processes with big number of employees are also: Change Management, Service Asset and Configuration Management, Release and Deployment Management and Service Level Management. This shows that the bigger number of employees is in the Service Transition and Service Operation phase than in Service Strategy or Service Design phase.

Implementation of the Telecom Operator According to the Itil V3 Best Practises: Table 2 shows the implementation of the second Telecom operator according to the eTOM standard [15, 16, 17].

Figure 3 shows the number of employees in Telecom Operator by using eTOM methodology. The process with the biggest number of employees is Service Development

Table 2: Teams in the implementation of the telecom operator according to the eTOM standard

Name of the eTOM process or function	Name of the team in the realization of each eTOM process	Number of people in each team
Marketing and Offer Management	T1: Team for defining services of the Telecom operator	T1=9
	T2: Team for managing sales	T2=20
	T3: Team for defining contents of all services of the Telecom operator	T3=8
	T4: Team for defining the catalogue of IT services	T4=3
Service Development and Management	T5:Team for the administration of network element for managing the Internet	T5=3
	T6: Team for the administration of the network element for managing the IPTV service	T6=5
	T7: Team for the administration and design of application for the IPTV service	T7=6
	T8: Team for the administration of the network element for managing the VoIP service	T8=4
	T9: Team for the administration of the network element for managing the Hosting service	T9=3
	T10: Team for the administration of the network element for managing the E-mail service	T10=2
	T11: Team for the administration of the Portal of the Telecom operator	T11=3
	T12: Team for the administration of the Monitoring service and network	T12=2
	T13: Team for the administration of the IP core network structure	T13=5
	T14: Team for the administration of the DSLAM network	T14=6
	T15: Team for the administration of the terminal devices	T15=6
	T16: Team for the development of applications on the network element for managing the Internet	T16=3
	T17: Team for the development of applications on the network element for managing the IPTV service	T17=3
	T18: Team for the development of application for the end users of the IPTV service	T18=4
	T19: Team for the development of applications on the network elements to manage the VoIP service	T19=3
	T20: Team for the development of applications on the network element for managing the Hosting service	T20=2
	T21: Team for the development of applications on the network element for managing the E-mail service	T21=2
	T22: Team for development of applications on the Portal of the Telecom operator	T22=4
	T23: Team for the development of applications for the Monitoring service and network	T23=3
	T24: Team for the development of the IP core network structure	T24=5
	T25: Team for the development of the DSLAM network infrastructure	T25=6
	T26: Team for the development of software on terminal devices	T26=6
Resource Development and Management	T27: Team for the administration of the central application of the Information system	T27=4
	T28: Team for the administration of the Provisioning system	T28=5
	T29: Team for the administration of the Billing system	T29=5
	T30: Team for the administration of the SAP system	T30=3
	T31: Team for the administration of the IT system infrastructure	T31=3
	T32: Team for the implementation of the central application of the Information system	T32=5
	T33: Team for the implementation of the Provisioning system	T33=4
	T34: Team for the implementation of the Billing system	T34=6
	T35: Team for the implementation of the SAP system	T35=3
	T36: Team for the implementation of the IT system infrastructure	T36=3
Supply Chain Development and Management	T37: Team for running tenders	T37=6
	T38: Team for defining legal and economical criteria for the tender	T38=3
	T39: Team for defining technical and professional criteria for the tender	T39=6
	T40: Team for executing the realization of tenders	T40=6
	T41: Team for managing relationship with strategic partners	T41=7
Customer Relationship Management	T42: Team for managing contents on the Portal	T42=4
	T43: Team for managing requests of Portal users	T43=3
	T44: Team for direct management of user requests	T44=4
	T45: Team for providing information and solutions to problems on the Internet service	T45=15
	T46: Team for providing information and solutions to problems on the IPTV service	T46=12
	T47: Team for providing information and solutions to problems on the VoIP service	T47=14
	T48: Team for providing information and solutions to problems on the Hosting service	T48=4
	T49: Team for providing information and solutions to problems on the E-mail service	T49=3
	T50: Team for solving computer problems	T50=3
	T51: Team for providing information and solutions to problems for the Portal of the Telecom operator	T51=3
	T52: Team for providing information and solutions to problems regarding the registration of services	T52=4

Table 2: Continued

Name of the eTOM process or function	Name of the team in the realization of each eTOM process	Number of people in each team
Service Management and Operations	T53: Team for the surveillance and monitoring of the core router	T53=3
	T54: Team for monitoring and the surveillance of service servers of the Telecom operator	T54=4
	T55: Team for monitoring and the surveillance of switches in the network of the Telecom operator	T55=5
	T56: Team for surveillance and the monitoring of the DSLAMS	T56=6
	T57: Team for monitoring and surveillance of the end-users terminal equipment	T57=8
	T58: Team for the surveillance and monitoring of the Internet service	T58=4
	T59: Team for the surveillance of the IPTV service	T59=4
	T60: Team for monitoring the VoIP service	T60=3
	T61: Team for monitoring the E-mail service	T61=2
	T62: Team for monitoring the Hosting service	T62=2
	T63: Team for monitoring the Portal of the Telecom operator	T63=2
Resource Management and Operations	T64: Team for monitoring and the surveillance of a system IT platform of the Telecom operator	T64=2
	T65: Team for monitoring functions of the central application of the Information system	T65=3
	T66: Team for monitoring applications of the Provisioning system	T66=2
	T67: Team for monitoring the Billing system	T67=4
	T68: Team for monitoring the applications of the SAP system	T68=2
	T69: Team for delivering bills to end-users	T69=20
	T70: Team for monitoring income from users of certain services	T70=8
Supplier/Partner Relationship Management	T71: Team for performing quantative and qualitative receptions of works from external companies	T71=6
	T72: Team for receiving goods	T72=4
	T73: Team for realization of goods reception in SAP	T73=3
Strategic and Enterprise Planning	T74: Team for planning the introduction of new services	T74=4
Enterprise Risk Management	T75: Team for monitoring the power supply in server halls	T75=4
	T76: Team for monitoring air-conditioning in server halls	T76=3
	T77: Team for managing the security of employees	T77=4
Enterprise Effectiveness Management	T78: Team for managing public relationships	T78=3
	T79: Team for designing final reports about business activities of the Telecom operator	T79=6
	T80: Team for forecasting future business results of the Telecom operator	T80=4
	T81: Team for managing relationships between units of the Telecom operator	T81=3
	T82: Team for monitoring and managing event of other Telecom operators	T82=3
Knowledge and Research Management	T83: Team for organizing professional workshops	T83=2
	T84: Team for professional and scientific education of Telecom employees	T84=3
Financial and Asset Management	T85: Team for managing investments	T85=6
	T86: Team for managing revenues	T86=6
	T87: Team for managing revenues of employees	T87=3
	T88: Team for managing the finances	T88=4
	T89: Team for managing the expenses of the Telecom operator	T89=4
Stakeholder and External Relations Management	T90: Team for managing consumer requests	T90=2
	T91: Team for managing requests of other Telecom operators	T91=3
	T92: Team for managing relationships with other international organizations	T92=3
Human Resources Management	T93: Team for managing contracts with end-users	T93=5
	T94: Team for managing human resources in the company	T94=6
	T95: Team for managing contracts with external companies	T95=6
	T96: Team for solving authorative complaints and litigations	T96=25

and Management Process and the process with the smallest number is Strategic and Enterprise Planning. The important processes are also: Resource Development and Management, Customer Relationship Management and Service Management and Operations.

Implementation of the New Etom Standard: The new improved eTOM standard for Telecom operators will be created from the ITIL V3 processes which currently do not exists in the existing eTOM standard [8]. This way new process according to the eTOM standard will be created

respectively the number of teams will be expended in an existing eTOM standard process.

With the help of the comparative analysis of teams of Telecom operators according to the ITIL V3 best practises and eTOM standard we can conclude that the eTOM standard is missing teams in processes like: Capacity Management, Availability Management, IT Service Continuity Management, Information Security Management, Incident Management, Problem Management, Access Management and Continual Service Improvement [18]. None of the team from these processes of the ITIL V3 best practises is included in the existing processes of the eTOM standard.

Taking into consideration that the processes like Capacity Management, Availability Management, IT Service Continuity Management and Information Security Management are from the domain of providing information security and continuous IT service security, which as such doesn't exist in the existing eTOM standard, the recommendation is that a new process is created which is called Information Security and Continuity Management and which will include 8 teams from these four ITIL V3 processes. When considering processes like Incident Management and Problem Management, then we can conclude that they represent the second and the third level of support to end-users so they can be included to the teams of the Service Desk which are according to eTOM standard implemented into Customer Relationship management. Therefore, 8 teams of Incident Management and Problem Management will be incorporated into Customer Relationship management together will the existing teams. Three teams from the process of Access Management will be included in the Customer Relationship Management along with existing teams. Three teams from the Access Management process are connected to the protection of the Telecom operators property and human resources and according to their specification are very similar to the teams from Enterprise Risk Management so they will accordingly be incorporated. Teams in the Continual Service Improvement are related to the regulation of existing organizational and to proposed a new organizational structure for the Telecom operator and as such are not similar to any existing process from the existing eTOM standard. Therefore, a new process will be created for Continual Improvement Management which will include three teams.

Accordingly, the new improved eTOM standard has 2 new processes: Information Security and Continuity Management (including the Capacity Management, Availability Management, IT Service Continuity Management and Information Security Management from the ITIL V3 best practises) which will be included in the strategic part of the standard and Continual Improvement Management (including the Continual Service Improvement Process from the ITIL V3 best practises) which will incorporated into the operational part of the standard. The processes of the Incident Management and Problem Management from the ITIL V3 best practises are included in the Customer Relationship Management, while the process of Access Management incorporated into the Enterprise Risk Management.

Teams and the number of people in each team in the new improved eTOM standard for the Telecom operator which was obtained by the comparison with the ITIL V3 best practises are shown in Table 3 [18].

Table 3: Improved eTOM standard of the Telecom Operator which was acquired from the comparison with the ITIL V3 best practise

Name of the eTOM process or function	Name of the team in the realization of a certain eTOM process	Number of people in each team
Marketing and Offer Management	T1: Team for defining services of the Telecom operator	T1=9
	T2: Team for managing the sales	T2=20
	T3: Team for defining the contents of all services in the Telecom operator	T3=8
	T4: Team for defining the catalog of the IT service	T4=3
Service Development and Management	T5: Team for the administration of the network element for managing the Internet	T=53
	T6: Team for the administration of the network element for managing the IPTV service	T6=5
	T7: Team for the administration and design of the application for the IPTV service	T=76
	T8: Team for the administration of the network element for managing the VoIP service	T8=4
	T9: Team for the administration of the network element for managing the Hosting service	T9=3
	T10: Team for the administration of the network element for managing the E-mail service	T10=2
	T11: Team for the administration of the Portal of the Telecom operator	T11=3
	T12: Team for the administration of the Monitoring service and network	T12=2
	T13: Team for the administration of the IP core network structure	T13=5
	T14: Team for the administration of the DSLAM network	T14=6
	T15: Team for the administration of terminal devices	T15=6
	T16: Team for the development of network elements for managing the Internet	T16=3
	T17: Team for the development of applications on the network element for the management of the IPTV service	T17=3

Table 3: Continued

Name of the eTOM process or function	Name of the team in the realization of a certain eTOM process	Number of people in each team
	T18: Team for the development of applications intended for the end-user of the IPTV service	T18=4
	T19: Team for the development of applications on the network element for the VoIP service	T19=3
	T20: Team for the development of applications on the network element for managing the Hosting service	T20=2
	T21: Team for the development of applications on the network element for managing the E-mail service	T21=2
	T22: Team for the development of applications on the Portal of the Telecom operator	T22=4
	T23: Team for the development of applications on the monitoring service and network	T23=3
	T24: Team for the development of IP core network structure	T24=5
	T25: Team for the development of the DSLAM network infrastructure	T25=6
	T26: Team for the development of software on terminal devices	T26=6
Resource Development and Management	T27: Team for the administration of the central application of the Information system	T27=4
	T28: Team for the administration of the Provisioning system	T28=5
	T29: Team for the administration of the Billing system	T29=5
	T30: Team for the administration of the SAP system	T30=3
	T31: Team for the administration of IT system infrastructure	T31=3
	T32: Team for the implementation of the central application of the Information system	T32=5
	T33: Team for the implementation of the Provisioning system	T33=4
	T34: Team for the implementation of the Billing system	T34=6
	T35: Team for the implementation of the SAP System	T35=3
	T36: Team for the implementation of the IT system infrastructure	T36=3
Supply Chain Development and Management	T37: Team for starting tenders	T37=6
	T38: Team for defining legal and economical criteria for the tender	T38=3
	T39: Team for defining technical and professional criteria for the tender	T39=6
	T40: Team for executing the realization of the tender	T40=6
	T41: Team for managing the relationships with strategic partners	T41=7
Information Security and Continuity Management	T42: Team for managing the IP network space of the Telecom operator	T42=3
	T43: Team for managing the performance system	T43=2
	T44: Team for managing the capacities of network elements, switches and DSLAMs	T44=3
	T45: Team for defining the plan for availability	T45=3
	T46: Team for defining and monitoring the backup service	T46=8
	T47: Team for the implementation of the backup service	T47=8
	T48: Team for defining the levels of information security	T48=3
	T49: Team for defining administrational roles for managing the Information system	T49=2
Customer Relationship Management	T50: Team for managing the contents on the Portal	T50=4
	T51: Team for managing the requests of users over the Portal	T51=3
	T52: Team for direct management of requests of users	T52=4
	T53: Team for providing information and solutions to problems on the Internet Service	T53=15
	T54: Team for providing information and solutions to problems on the IPTV service	T54=12
	T55: Team for providing information and solutions to problems on the VoIP service	T55=14
	T56: Team for providing information and solutions to problems on the Hosting service	T56=4
	T57: Team for providing informations and solutions to problems on the E-mail service	T57=3
	T58: Team for solving computer problems	T58=3
	T59: Team for providing informations and solutions to problems regarding the Portal of the Telecom operator	T59=3
	T60: Team for providing informations and solutions to problems regarding the registration of services	T60=4
	T61: Team for solving service incidents	T61=4
	T62: Team for solving incidents on the DSLAM	T62=5
	T63: Team for solving incidents on terminal devices	T63=8
	T64: Team for solving incidents on the Information and Billing system	T64=6
	T65: Team for solving problems on services	T65=3
	T66: Team for solving problems on the IP core network	T66=2
	T67: Team for solving problems on the DSLAM	T67=3
	T68: Team for solving problems on the Information system, Provisioning system and the Billing system	T68=3

Table 3: Continued

Name of the eTOM process or function	Name of the team in the realization of a certain eTOM process	Number of people in each team
Service Management and Operations	T69: Team for monitoring the core router	T69=3
	T70: Team for monitoring and surveillance of the server of services in the Telecom operator	T70=4
	T71: Team for monitoring and the surveillance of switches in the network of the Telecom operator	T71=5
	T72: Team for monitoring and the surveillance of the DSLAMs	T72=6
	T73: Team for monitoring and the surveillance of end-users terminal equipment	T73=8
	T74: Team for monitoring the Internet service	T74=4
	T75: Team for monitoring the IPTV service	T75=4
	T76: Team for monitoring the VoIP service	T76=3
	T77: Team for monitoring the E-mail service	T77=2
	T78: Team for monitoring the Hosting service	T78=2
	T79: Team for monitoring the Portal of the Telecom operator	T79=2
Resource Management and Operations	T80: Team for monitoring and surveillance of the system IT platform of the Telecom operator	T80=2
	T81: Team for monitoring the function of the central application of the Information system	T81=3
	T82: Team for monitoring the applications of the Provisioning system	T82=2
	T83: Team for monitoring the Billing system	T83=4
	T84: Team for monitoring the SAP system	T84=2
	T85: Team for delivering bills to end-users	T85=20
	T86: Team for monitoring the management of incomes from service users	T86=8
Supplier/Partner Relationship Management	T87: Team for conducting quantative and qualitative receiving's of works from external companies	T87=6
	T88: Team for receiving goods	T88=4
	T89: Team for the realization of good reception in the SAP	T89=3
Strategic and Enterprise Planning	T90: Team for planning the introduction of new services	T90=4
Enterprise Risk Management	T91: Team for monitoring the power supply in the server hall	T91=4
	T92: Team for monitoring the air-conditioning in the server halls	T92=3
	T93: Team for the management of security employees	T93=4
	T94: Team for securing all objects of the Telecom operator	T94=6
	T95: Team for securing the server halls and network equipment	T95=5
	T96: Team for managing the security of human resources	T96=10
Enterprise Effectiveness Management	T97: Team for managing the public relationships	T97=3
	T98: Team for designing the final report on the Telecom operators operations	T98=6
	T99: Team for predicting future operation results of the Telecom operator	T99=4
	T100: Team for managing the relationships between organizational units of the Telecom operator	T100=3
	T101: Team for monitoring and managing events of other Telecom operators	T101=3
Knowledge and Research Management	T102: Team for organizing workshops	T102=2
	T103: Team for educating Telecom employees in a professional and scientific manner	T103=3
Financial and Asset Management	T104: Team for managing investments	T104=6
	T105: Team for managing revenue	T105=6
	T106: Team for managing employees pay	T106=3
	T107: Team for managing the overall finances	T107=4
	T108: Team for managing the expenditure of the Telecom operator	T108=4
Continual Improvement Management	T109: Team for monitoring the functional units of the Telecom operator	T109=6
	T110: Team for improving existing processes	T110=5
	T111: Team for proposing a new organizational structure for the Telecom	T111=7
Stakeholder and External Relations Management	T112: Team for managing customer requirements	T112=2
	T113: Team for managing the requirements of other Telecom operators	T113=3
	T114: Team for managing relationships with international organizations	T114=3
Human Resources Management	T115: Team for managing contracts with end-users	T115=5
	T116: Team for managing human resources in the company	T116=6
	T117: Team for managing contracts with international companies	T117=6
	T118: Team for resolving formal complaints and lawsuits	T118=25

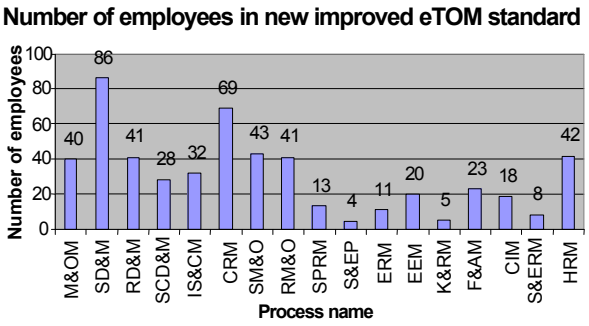

Fig. 4: The number of employees in Telecom Operator by using new and improved eTOM standard

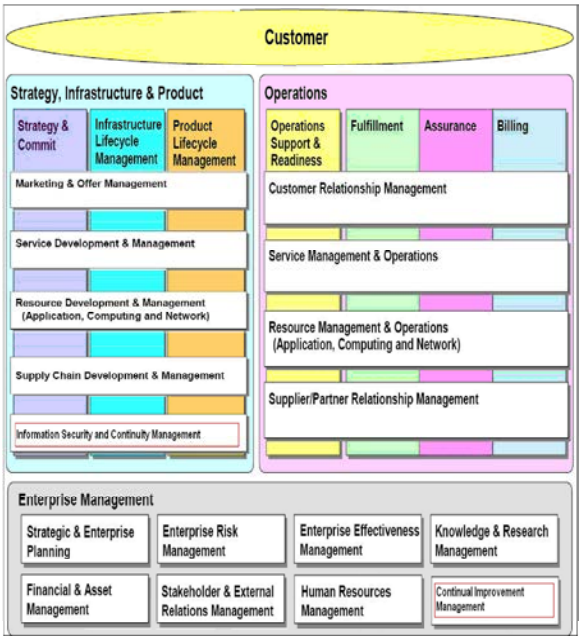

Fig. 5: Schematic representation of the new improved eTOM standard

Figure 4 shows the number of employees in the Telecom Operator by using new and improved eTOM standard which has 2 new processes: Information Security and Continuity Management with a number of 32 employees and Continual Improvement Management Process with a number of 18 employees.

Figure 5 shows the schematic representation of the new improved eTOM standard in which are inserted two new processes: Information Security and Continuity Management and Continual Improvement Management. The schedule of the processes on the existing eTOM standard has not changed. The new eTOM standard has 17 instead of the previous 15 processes and presents and improvement in information security and organizational structure of the Telecom operator.

Processes of the new eTOM standard are: *Strategy, Infrastructure and Product* - Marketing and Offer Management, Service Development and Management, Resource Development and Management, Supply Chain Development and Management, Information Security and Continuity Management, *Operations* - Customer Relationship Management, Service Management and Operations, Resource Management and Operations, Supplier/Partner Relationship Management, *Enterprise Management* - Strategic and Enterprise Management, Enterprise Risk Management, Enterprise Effectiveness Management, Knowledge and Research Management, Financial and Asset Management, Stakeholder and External Relations Management, Human Resources Management and Continual Improvement Management.

CONCLUSION

The new improved eTOM standard should allow for increased information security for the Telecom operator, increase the level of support for end-users and improve the level of control over the organizational units of the Telecom operator. For this purpose it is necessary to hire 22 new teams and 105 new people within the 22 teams. The new improved eTOM standard compared to the same old standard provides:

- Managing the IP network space of the Telecom operator
- Managing the systems performance
- Managing the capacity of the network elements, coils and DSLAM's
- Defining an availability plan
- Defining and monitoring backup services
- Implementing a backup service
- Defining the levels of information security
- Defining the role of administrative control over the Information system
- Solving incidents in the DSLAM
- Solving incidents in the terminal devices
- Solving incidents in the Information and Billing System
- Solving problems in the service
- Solving problems in the IP core network
- Solving problems in the DSLAM
- Solving problems in the Information system, Provisioning System or Billing System
- Security of all Telecom operator buildings
- Security of the server room and networking equipment

- Managing the security of human resources
- Monitoring the functional units of the Telecom operator
- Improving existing processes
- Proposing new organizational structures for the Telecom operator

Future research in this area will be focused on connecting the new and improved eTOM standard and the PRINCE2 standard which is intended for managing IT projects [8]. The aim of the new research is to incorporate into the new improved eTOM standard a specific process which is linked to managing IT projects, in order to increase the efficiency of implementing the projects themselves in the Telecom industry.

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