

# Key Concepts of the Deployment of the Information Technologies Infrastructure Library (ITIL) – Structure, Conceptions, Deployment

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**Key Words:** IT management; ITIL; integration; service transition.

**Abstract.** This article gives the ITIL framework objectives, structure and functionalities. We explore the ITIL best practices with application to several real cases. It is shown where and how much ITIL is efficient in different real situations.

## 1. Introduction

During the last ten years ITIL (Information Technology Infrastructure Library) became most often used framework for managing IT processes. It contains full class with best practices which aim to support the delivery of an optimized IT service.

It provides full asset of guidelines how a certain situation about handling the IT service to be handled. These instructions are called best practices and they are based on the experience on many firms and enterprises. These practices ensure that the task is completed in the most efficient and cost effective way, that makes its resolution a part of the global strategy of the firm. The developers of ITIL (Stationary Office, UK [17]) state that the framework is industry-independent and can deliver benefits to each corporate IT environment. However, there are reports claiming that some organizations didn't meet their expectations after the implementation of ITIL.

ITIL has been developed at the end of the '80s by the UK Government's Central Computer and Telecommunications Agency. Then ITIL didn't contain practices but just an asset of recommendations. Afterwards separate public and private sector organizations have started creating independent best practices sets, based on these recommendations. Until this moment there are 3 revisions created over the ITIL library: the second one was published on 2006 and the third one on June 2011.

The main subject of the all ITIL methodology is the IT service. All the practices are pointed to manage and support the IT service. The definition of service pointed in the the Official Introduction to the ITIL Service Lifecycle [1] is:

"A 'service' is a means of delivering value to customers by facilitating outcomes customers want to achieve without the ownership of specific costs and risks."

## 2. Key Principles of ITIL

The primary business goal of ITIL is to support the company for achieving its primary business goals, by pro-

viding it with cost effective and highly productive IT environment. Following the context of this, its core principles can be summarized as follows:

- Adding value to the service.
- Deliver high customer satisfaction.
- Improve the usage of skills and experiences.
- Improve the productivity.
- Reduce the costs.

The bullets listed above reflect the main expectations to the leadership of organizations that explore the opportunity to integrate ITIL in their process maps. On most of the cases these principles also support the forming of the customers' expectations. Depending on the company's business model these expectations are translated into measurable outcomes that need to be achieved after the integration. It is required that the ITIL implementation architects understand well the nature of the mentioned deliverables. This can assure that the outcome doesn't conflict with ITIL's core principles and the goals can be met.

ITIL is designed as a framework, which means that it provides only high level overview how the processes should follow and does not requires strict following for all of them. This general rule is also being supported by the design of ITIL – it is structured in a way that allows the companies to use only the processes that they find for useful and applicable. All the processes are designed in a way that allows them to be used independently or together with the adjacent ones.

## 3. ITIL Coexistence with Other Management Frameworks

In the most of the real life scenarios, the companies use different frameworks and standardizations that interfere in between. This mixture is needed for achieving the full asset of functions, necessary for the particular IT infrastructure. There are not limitations for ITIL to interfere with other frameworks as it offers only best practices with no obligatory character. These best practices also give guidelines how to effectively act with roles like a project manager in order to have effective cooperation. It is most often necessary the synergy between ITIL, a project management framework and an ISO or another standardization. There is a research [16] that studies the coexistence of four widely used frameworks and standardization:

- ITIL framework for managing the IT service.
- CobiT – IT Governance framework that mainly focuses on the goal how the IT department and service should be controlled.
- CMMI – this is a framework focused on the software development. It aims to optimize the whole process of software product creation, increase its quality and optimize its cost.
- ISO9001 – standardization that assures general quality management levels.

The coexistence is described in the graphic below [17]:

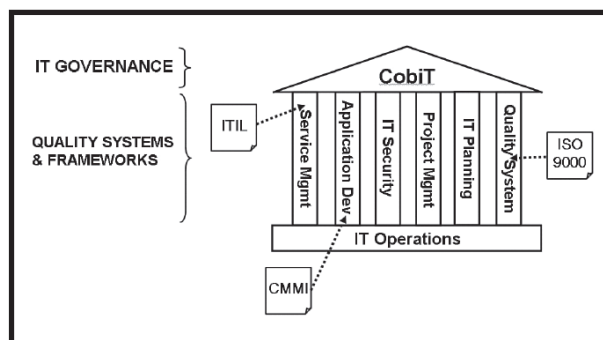


Figure 1. Relationship of four frameworks to IT functions

## 4. Goals of ITI

The main goal of ITIL is to provide the IT managers as well as the whole organization with end-to-end processes which can allow them to have managed IT processes. These processes have to be able to continuously improve the organization's service. They also have to support meeting its strategic goals. This goal can be separated to the following sub-goals:

- **User (account) satisfaction** – this is the main goal which has to be reached when delivering the service. For achieving it, complicated mixture of sub goals have to meet. Satisfaction is most often periodically measured in organization level (quarter, half year, yearly). Of course the feedback by the affected users is also needed for this scoring.

- **Optimized resource use** – the Capacity Management ITIL process aims to involve needed resources in the most cost-efficient manner.

- **Workflow optimization** – continual service improvement ITIL process is responsible for unstoppable workflow improvement.

- **Enhanced information security** – regarding the ISO standard 17799:2000 [6] *"Information security is achieved by implementing a suitable set of control, which can be policies practices, procedures, organizational structures and software functions. These controls need to be established to ensure that the specific security objectives of the organization are met"*. That means that ITIL is not directly used to implement security but it may lead to enhanced security through controlled processes. It is mainly achieved by the Availability management.

- **Clear end-to-end monitoring** – ITIL separates the monitoring activities in two parts:

- o Proactive monitoring. By ITIL v. 3 specification it is [7] *"Monitoring that looks for patterns of Events to predict possible future Failures"*.

- o Reactive monitoring or just monitoring which by specification means *"Repeated observation of a Configuration Item, IT Service or Process to detect Events and to ensure that the current status is known"*.

- **Clear roles defining** – according to any ITIL's process there are set of roles. They are being assigned to one or more employees. In particular cases some of these roles can be merged or replaced by the higher one as these cases are defined in the process.

## 5. ITIL Appliance

According to the official foundations exam preparation book [17] ITIL is industry independent framework. This means that it can be integrated in each company no matter of the core business.

To illustrate how the ITIL is applied we present several case studies.

### Case study 1:

The case study described in [18] represents successful implementation of ITIL in Croatian financial services company. It has about 5000 employees situated on more than 100 locations. Due to the geography and applications complexity the company has 130 IT employees who support more than 100 different services. The coverage window for the critical services is 24 x 7.

The management of this company was demanded to increase the efficiency and quality of the IT service. The strategy they followed included two main streams: to integrate IT service management processes and to educate their IT staff to more proactive attitude.

In order to follow the best practices in the change management, the implementation subject matter experts decided to implement ITIL in two stages – one pilot implementation and then the full transformation. The pilot included to implement the new processes only for the internal support in order to avoid the risk of impacting the service for the company's customers. The whole ITIL implementation took less than two years including the whole implementation cycle. The successful impact from the ITIL integration was measured with Key Performance Indicators (KPI).

Table 1. KPIs for incident management before and after the ITIL implementation [18]

KPI	Before ITIL impl.	After ITIL impl.
Average time for solving incidents	36 min.	24 min.
% of total number of incidents which were solved on first level support	18%	37%
% of total number of incidents which had mayor impact on services	22%	20%
% of total number of incidents which were received beside Service Desk	16%	5%

**Table 2.** KPIs for problem management before and after the ITIL implementation [18]

KPI	Before ITIL impl.	After ITIL impl.
Number of mayor problems	22	7
Number of repeated problems	11	8
Average time for diagnose problems and discover root cause of problems	4,5 hours	3,5 hours
% of solved problems which were solved proactively and reactively	20 % proactively, 80 % reactively	45% proactively, 55% reactively

### Case study 2:

In [19] Lohana Lema et al. conduct systematic literature review that aims to find relevant case studies answering the following two questions:

- What is the implementation sequence (of three items) of ITIL V3 processes most suggested/used in SMEs.
- What are the most suggested/used criteria for determining an implementation sequence of ITIL V3 processes in SMEs.

They target case studies for the European small and medium software enterprises that have respectively up to 250 and 500 employees. The literature review is conducted based on the following data sources: ACM Digital Library, ACM Digital Library, IEEE Computer Science Digital Library, Springer Link, Springer Author Mapper, Science@Direct, Software Engineering Institute, ISI – Web of Knowledge and Google Scholar. The researchers found 1276 articles where 77 of them were relevant and 9 were primary. The authors focused on the last group of nine articles and made the following conclusions:

- The sequence of implementation of ITIL processes is as follows: Incident management -> Service Level Management process and Service Catalogue Management -> Service Asset and Configuration Management Process.
- “Quick wins” is the criterion most reported by experts; criteria such as Strengthen Service Support, Customer Services and Demands Prioritization are suggested too.

This research represents the approaches used in the major piece of the software companies in Europe as the small and medium enterprises represent 99% of the software business in the continent.

### Case study 3:

In [20] we proposed approach that supports the decision makers to develop successful high level ITIL implementation scenario. This was achieved using MCDA (Multi criteria decision analysis) approach. It gives a big flexibility

for the decision maker(s) to manage his experts’ proposals and calculate the data. The output from the provided calculations can be used both as proposal to other decision makers, as well as justification data, that can be sent to the company’s executives and additional approvers. The approach was successfully tested in a healthcare company.

Additionally reviewed case studies describing successful ITIL implementation can be found for example in [2] and [5].

The following conclusions can be made.

There are many reports for successful implementation in both the public and the private sector. Also big variety of types of organizations is reported: universities, healthcare, IT companies, production, financial etc.

The applicability in relation to the size of the company also needs to be reviewed. The structure presented in “8. ITIL v.3 main subjects” [1] describes scalable framework. As also described in [17] for smaller organizations different process groups can be either merged or missed depending on the business goal. It is important to mention that it is not necessarily to implement all the ITIL processes and best practices in order to achieve optimized management of the IT environment. This is allowed according to the framed structure of the library. For the purpose of the small environments most of the roles can be merged to be delivered by one and the same employee responsible for that.

To summarize:

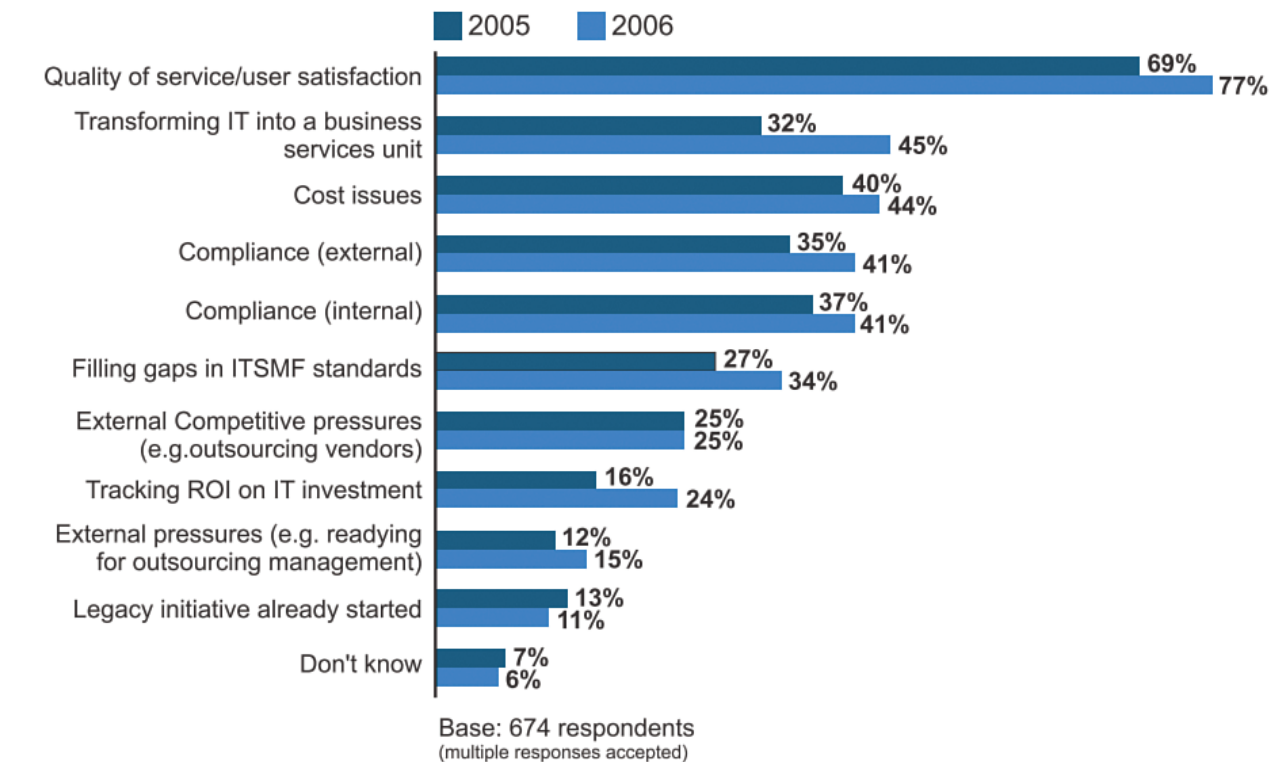
There is no official definition, or frame which says in what type of business the ITIL framework can be implemented successfully. Basically the framework is not dependent by the organization’s type of business. It is wide applicable, as the processes are universal and not directly interfering with the main product of the business.

There can be entered a rule, that bigger companies adopt easier ITIL than the small ones. The reason is mainly lack of resources and unsure results expected. As said in “delivering effective support. Adopting ITIL to fit your IT Business Model” [1] after conduct qualitative research with focus group of 30 companies: “Many companies felt that they had insufficient resources to implement such rigorous IT support standards as ITIL. Negative attitudes centred on standards being too much hassle, too costly or just not important enough to spend time on”.

## 6. Benefits of Implementing ITIL

Based on a Forester Research Inc. (see *figure 1*) questionnaire about “What were/are your main drives for investing in service management?” more than 2/3 of the companies had answered that they expect higher quality of the IT service and higher user satisfaction. Also almost half of them are aiming to separate the IT departments into business service units. More than 40% expect to make cost savings with ITIL implementation. Here needs to be mentioned that the cost reducing is long term goal, as there are initial investments, which need to be made: for rearranging the human resources roles, to buy/create new software products, consulting services costs and etc.

## "What were/are your main drivers for investing in service management?"



Source: Forrester Research, Inc.

**Figure 2.** This research chart shows what the companies expect to receive after implementing IT service management  
Source: Forrester Research Inc

## 7. ITIL v. 2 Main Subjects

### Service Support

This book of the library covers one of the core functions of ITIL. It contains all the necessary practices for making the end user satisfied by providing him with uninterrupted it service.

There are defined six chapters which separate the functions included in the Service Support:

### Service Desk

This chapter includes guidance for managing service desk department. This department provides primary point of contact for the end users as providing them assistance for solving wide range IT problems, including software, hardware and network issues. The number of technologies, supported by the service desk is about 2000 [3]. Such a significant count of technologies cannot be supported by one team. Following ITIL best practices, many organizations with huge amount of technologies separate their service desks to teams corresponding to different subject matters. Also there is additional separation on levels of escalation. In case when a complicated problem cannot be solved by the

first call, the corresponding service desk agent can escalate it to second line service desk team, which is technically more experienced than the first level. It is typical when increasing the level of escalation to decrease the number of supported technologies for the team.

The Service Desk management has significant impact over the user satisfaction level, because it is the only team which has direct connection (most often via phone) with the end user. No matter to which support team the case is escalated, the service desk agent leave the single point of contact for the user. This is why the service desk agents are actively trained to gain advanced soft skills like phone conversation structure, persistence, patience and listening skills, corporate business conduct communication skills and etc. The service desk agent has the role of presenter of the whole IT support organization or department in front of the supported end user.

### Service Delivery

The service delivery book covers the business frame which describes how the IT management will be delivered. This book describes how an IT service support contract should be created. The service delivery has following five components:

- **Service Level Management**

This management process provides framework which



defines how the IT service will be delivered. It defines the role separation and agrees the common processes which will be used. All these agreements are described in the SLA (Service Level Agreement). As said in Service Level Agreements on IP Networks [4] *“A service level agreement (SLA) is a formal definition of the relationship that exists between a service provider and its customer. An SLA can be defined and used in the context of any industry and is used to specify what the customer could expect from the provider; the obligations of the customer as well as the provider; performance, availability, and security objectives of the service, as well as the procedures to be followed to ensure compliance with the SLA”*.

Service level management is useful to work at the interface between business and IT. The benefits can be multiple. For example, it helps organizations to become aware of the mutual expectations between business and IT [15].

- **Capacity Management**

The Capacity Management process ensures that the evolved IT resources will satisfy the business needs of the infrastructure in effective and cost efficient manner. The capacity management activities should be proactive in order to be successful. All the reactive actions in this process are caused by service interruption or delay and not accurate business planning.

- **Contingency Planning**

Contingency Planning process ensures that the IT service can recover and continue functioning in case of major incident occurs. This management process includes proactive and reactive actions to be taken, as the proactive ones are for reducing the risk of failure. The reactive actions are described in a Disaster Recovery Plan document.

Contingency planning is sufficient part of the IT delivery process. Many companies refuse to sign the service level agreement without solid disaster recovery plan.

- **Availability Management**

The availability management process is responsible for ensuring that the IT service is production in accordance with the Service Level Agreement conditions. Despite of the contingency management, the availability management has focus over all types of incidents, not only the major ones. There are agreed targets about the IT service uptime, which the SLA describes. The availability management process ensures that these goals are met in the most effective manner.

- **IT Financial Management**

The financial management process is responsible about determining and managing the cost for the whole IT service. This process is being executed during the whole lifecycle of the provided IT services. Before implementing new type of IT service, the financial management involved agents are responsible to provide cost analysis for it to the IT executives. These analyses can contain several options as well as recommendations, but they cannot act as decision makers. Another responsibility for the financial management involved team is to monitor the annual costs for provided service (example: server support, ISP fees, third part suppliers fees, etc) and create reports. In case of over-budgeting the financial management team need to notify involved counterparties.

## ICT Infrastructure Management

This process is responsible for managing the Information and Communication Technology (ICT) infrastructure from the perspective of the technical best scenario requirements. It is responsible to provide best practices for the technical functioning of the infrastructure.

ICT infrastructure management process is divided into the following sub processes:

- **ICT design and planning**

This process contains best practices about designing or extending an environment meeting company's business goals. The engaged IT team have to work closely with the business architects of the company in order to ensure that needed business needs are satisfied with the proposed computer components and workflow.

- **ICT deployment**

This sub process manages the deployment of the IT components. It includes much collaboration with the project management team, as well as many practices interfering with PRICE2.

- **ICT operations**

This sub process provides best practices about day-to-day activities such as backup and restores, system/network/database monitoring, etc.

- **ICT technical support**

ICT technical support sub process provides best practices for the higher level technical support teams. Almost always they are level 3 technical supports. These teams provide in-deep incident solving analysis. Despite of the service desk teams, the Level 3 ones support a little count of products per team. The L3 team often assist in the design and planning process.

## Security Management

This group of processes is responsible for protecting company's information. They should constantly support the confidentiality, integrity and availability of the information. As the IT environment is constantly changing there are needed periodic activities which ensures the company data is treated accordingly. The IT Security Management includes also activities like data centers access control and users workstations physical safety rules.

In ITIL v3, the Security Management becomes a part of the Service Delivery processes.

## 8. ITIL v. 3 Main Subjects

One of the main principles in the third version of ITIL is that it is focused over the full cycle of the service, until the version 2 gives the main attention over specific activities around the service delivery and service support. This third version allows the ITIL to be more independent from the perspective of the industry type. It is also much easier to implement it due to the facilitated content.

There are also significant changes to the terminology in the new version.

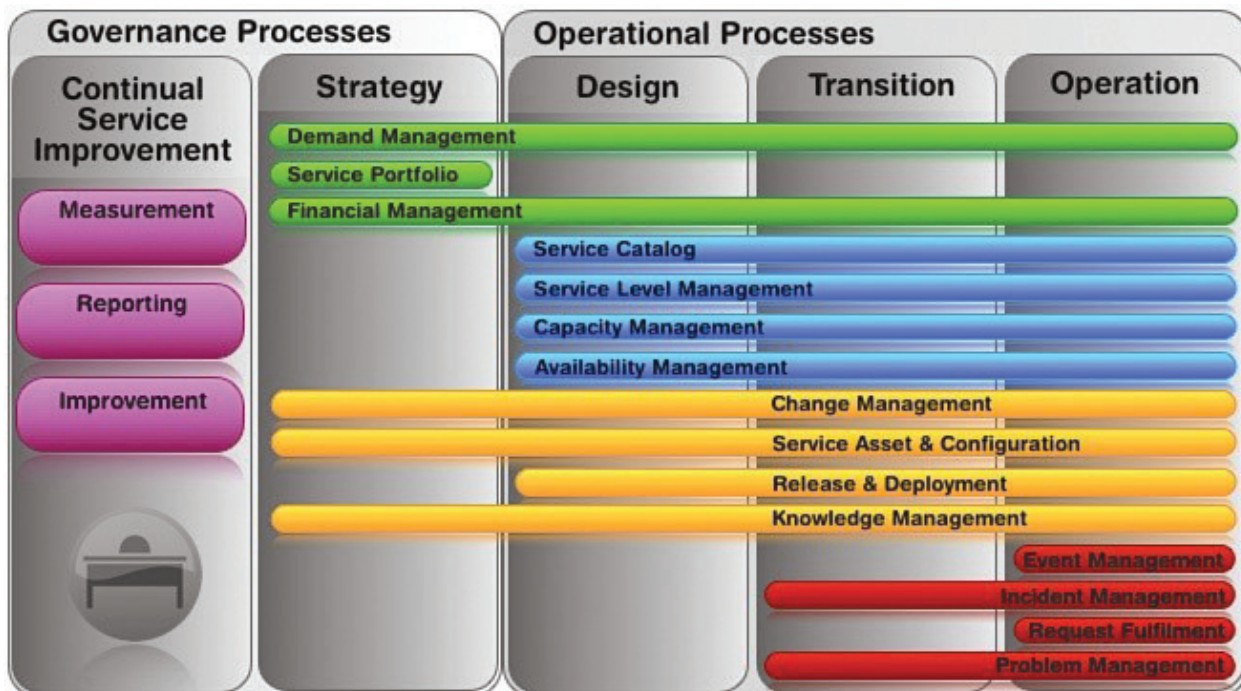
ITIL v3 processes are separated into 5 core subjects: **Service Strategy, Service Design, Service Transition, Service Operation, and Continual Service Improvement**. As shown in *figure 3*, these subjects can be separated into two main streams depending on the process orientation.

• Governance Processes – *IT governance is defined as the leadership and organizational structures, processes and relational mechanisms that ensure that an organization's IT sustains and extends its strategy and objectives*. [8]. As seen in *figure 3*, the Governance processes include the Service

Strategy and Continual Service Improvement processes.

• Operational processes – these are the **Service Design, Service Transition, Service Operation** processes. They are responsible for the actual delivery of the agreed service.

There are 26 processes in common, described in ITIL v3. The most important of them are showed horizontally in *figure 3*. As it can be seen, most of them are placed in multiple subjects. The corresponding part of the process is described at any subject separately.



**Figure 3.** ITIL v3 Processes Classification

## ITIL Service Strategy

Service Strategy addresses techniques to specify and evaluate services (e.g. principles, economy, and risks) [9]. As seen from *figure 1* this is the core asset of ITIL processes as it is at the very beginning of the service lifecycle. The ITIL Service Strategy is covered into five processes listed below:

- Strategy Management.
- Service Portfolio Management.
- Financial management for IT services.
- Demand Management.
- Business relationship management.

## ITIL Service Design

The Service Design [10] processes are responsible to provide best guidance for developing the IT service. They are responsible to managing the environment availability and capacity. There are also designed the information security politics in this chapter.

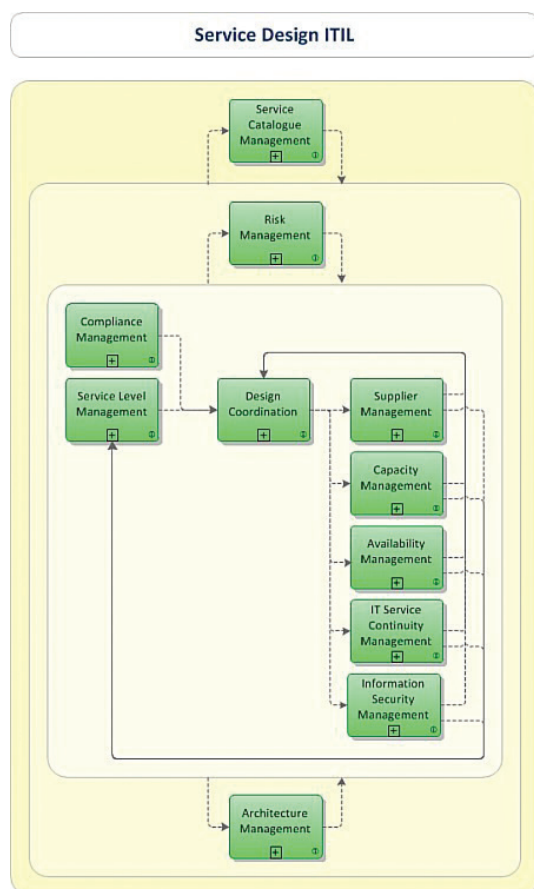
All the processes included in the Service Design are

taking part into all operational processes chapter as they need to ensure proper functioning after their developing (see *figure 1*).

There are eight main processes over the Service Design subject:

- Design coordination (Introduced in ITIL 2011 Edition).
- Service Catalogue.
- Service level Management.
- Availability Management.
- Capacity Management.
- IT Service Continuity Management (ITSCM).
- Information Security Management System.
- Supplier Management.

*Figure 4* describes how these processes collaborate each-other. As seen in the figure, there are three additional processes. They have been added in the later 2011 revision of ITIL v. 3. They are Risk Management, Design Coordination and Compliance Management. They have been added with the purpose to make ITIL able to satisfy the demanding business needs.



**Figure 4.** Process collaboration into the Service Design Graphic  
source: it-processmaps.com

Service level management is responsible for maintaining the Service Level Agreement (SLA) which is being continuously being optimized. *A Service Level Agreement (SLA) is a formal negotiated agreement between two parties. It is designed to create a common understanding about service quality, priorities, responsibilities, etc. SLAs can cover many aspects of the relationship between the Customer and the Service Provider (SP), such as performance of services, customer care, billing, service provisioning, etc. Given these factors, SLAs provide significant value in facilitating acquisition/contract processes for SPs and customers [11].* This is supported by the continual service improvement. As the SLA is a contract containing plenty of values and measurable key performance indicators (KPI) which are to be followed, it is one of the subjects in which we can focus in future. It is possible to develop mathematical method which to help us evaluating the efficiency of the SLA parameters and their values. This is a current issue as there are many case studies which describe companies with well written SLA which is strictly followed by the delivery origination, but with no customer satisfaction achieved.

## ITIL Service Transition

Considering the number of business processes in an enterprise and the complexity of the dependency network of processes to invoked services, changes in this kind of en-

vironment may pose significant risks due to the multitude of interdependencies and uncertainties to manage, and the impact of failures is likely to be business-critical as many business processes might depend on this service. [16]

This part of ITIL provides best practices and processes for building the service which the business requires in order to operate as required. The service transition processes are closely linked to the Service design processes. The Service transition processes are responsible to build and improve the IT tools and technology in a manner which is explained in the service design documents.

The processes involved in this chapter are listed below:

1. Transition planning and support.
2. Change management.
3. Service asset and configuration management.
4. Release and deployment management.
5. Service validation and testing.
6. Change evaluation.
7. Knowledge management.

## ITIL Service Operation

This group of processes ensures that the service is delivered in the most effective and efficient manner. It manages the service after it has been deployed and during it is in production. This is the place where the service value is realized. The service operations tasks include fulfilling user requests, resolving incidents, fixing problems, etc.

It includes five core groups of processes:

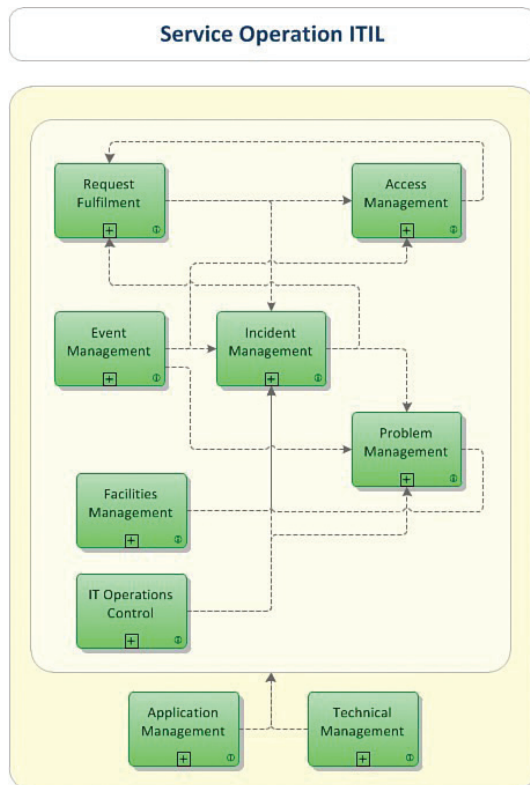
- Event management.
- Incident management – the ITIL divides the incident management process into several steps: incident detection and recording, classification and initial support, investigation and diagnosis, resolution and recovery, closure, and tracking [13].
- Request Fulfillment – these processes are responsible to help delivering effective resolution of the service requests. Regarding UCISA ITIL – A guide to request fulfillment *the term service request is used as a generic description for many, varying types of request from users that are made to the IT department. Many of these service requests are actually small changes – low risk, frequently occurring, low cost, etc. [12].*
- Problem management – it aims to identify the underlying cause. A problem may be suspected because there are incidents, but obviously the objective is to be proactively and prevent disturbances where possible [14].

- Access management.

Service Operations processes were also updated with following processes in order to make the chapter more accurate and detailed:

- Facilities Management.
- IT Operations Control.
- Applications Management.
- Technical Management.

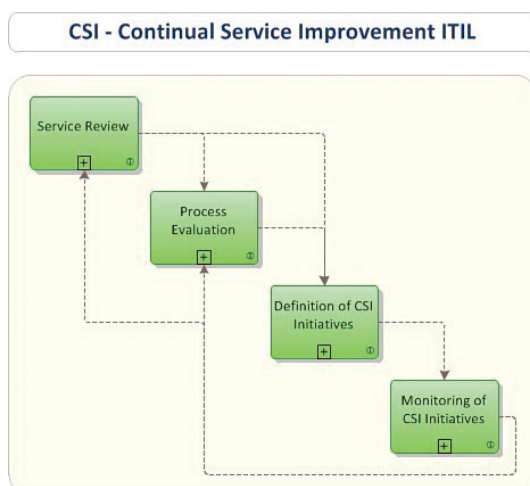




**Figure 5.** Process collaboration into the Service Operations  
Graphic source: it-processmaps.com

## ITIL Continual Service Improvement

This part aims to evaluate and benchmark the service management processes periodically in order to enhance their effectiveness. As every business is different and has different approaches and goals, this part of ITIL is pretty important from strategic perspective. It helps the IT delivery organization to adapt to these goals and optimize its processes and resources. Successful using of the Continual Service Improvement leads to excellent customer satisfaction based on the requirements for adequate tools provisioning, constant uptime, fast and helpful response to service requests.



**Figure 6.** Process collaboration into the Continual Service Improvement  
Graphic source: it-processmaps.com

As it can be seen in *figure 7*, the process loop includes four main stages including review of the current service, evaluation of the current process efficiency, identifying actions which should be taken in order to improve the current service level. After that the results of these initiatives are being monitored and again this loop can be performed on yearly or quarterly basis. This process can also be triggered proactively after specific event as decreasing of the service level, changing/extending the business subject of the organization.

## 9. Conclusion

Based on the reviewed structure of ITIL, its principles and its logics as well as the reviewed case studies it can be concluded that this IT management framework has wide range of industries in which can be successfully implemented. This is proved by the reviewed in this article case studies – all the examined companies acquire ITIL successfully and optimize their IT department efficiencies.

It is noticed that examined companies start to search for IT management solution after they expand their business and the IT infrastructures begins to be complicated and more responsible for the quality of the main business product.

## References

1. OGC – Office of Government Commerce. The Official Introduction to the ITIL Service Lifecycle. The Stationery Office, 2007, ISBN 9780113310616.
2. White, A. Delivering Effective IT Support. Adopting ITIL to Fit Your IT Business Model. Numara Whitepaper, 2007.
3. Sandborn, S. Structuring the Service Desk. – *Information World*, 23, 2001, 52, 28.
4. Verma, D. Service Level Agreements on IP Networks. – *Proceedings of the IEEE*, 92, 2004, Issue 9, 1382-1388, ISSN: 0018-9219.
5. Implementing Financial Management for IT – Office of Government Commerce, Service Delivery. The Stationery Office, 2001, ISBN: 0113300174.
6. BS ISO/IEC 17799:2000 (BS 7799-1:2000). Information Technology – Code of Practice for Information Security Management. ISBN: 9780580402500.
7. Office of Government Commerce. Service Delivery. IT Infrastructure Library. The Stationery Office, 2001, ISBN 0-11-330017-4.
8. De Haes, S. and W. Van Grembergen. IT Governance and Its Mechanisms. – *Information Systems Control Journal*, 1, 2004.
9. Wegmann, A., G. Regev, G.-A. Garret, F. Marechal. Specifying Services for ITIL Service Management. The International Workshop on Service-Oriented Computing Consequences for Engineering Requirements (SOCCER'08), Barcelona, 2008.
10. Hunnebeck, L. ITIL Service Design. The Stationery Office, 2011, ISBN 978-0113313051.
11. Trygar, T., Telcordia Technol., NJ Piscataway, G. Bain. A Framework for Service Level Agreement Management. Military Communications Conference, MILCOM 2005, IEEE, 1, 2005, 331-337, ISBN: 0-7803-9393-7.
12. Universities and Colleges Information Systems Association. ITIL – A Guide to Request Fulfilment, 2008, ISBN: 0-87773-078-4.
13. Guo, W., Ying Wang. An Incident Management Model for SaaS Application in the IT Organization, Research Challenges in Comput-



er Science. ICRCCS '09, 2009, 137-140, ISBN: 978-0-7695-3927-0.  
 14. 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 V3. The Office of Government Commerce, September 2007.

15. Wegmann, A. Specifying Services for ITIL Service Management; Service-Oriented Computing: Consequences for Engineering Requirements, SOCCER '08, 2008, 8-14, ISBN: 978-1-4244-4082-5.

16. Setzer, T. Internet-Based Inf. Syst. Tech. Univ. Munchen, Garching Bhattacharya, K., H. Ludwig, Network Operations and Management Symposium, 2008, NOMS 2008, IEEE, ISBN: 978-1-4244-2065-0.

17. Stationery Office. 3rd Ed. ITIL Foundation Handbook, London, 2008, ISBN: 0113313497.

18. Spremic, M., Z. Zmirak, K. Kraljevic. IT and Business Process

Performance Management: Case Study of ITIL Implementation in Finance Service Industry. Proceedings of the ITI 2008, 30th International Conference on Information Technology Interfaces, 2008, Croatia, ISSN: 1330-1012.

19. Lema, L., José-Antonio Calvo-Manzano, Ricardo Colombo-Palacios, Magdalena Arcilla. ITIL in Small to Medium-sized Enterprises Software Companies: towards an Implementation Sequence. – Journal of Software: Evolution and Process, 27, August 2015, Issue 8, 528–538.

20. Mitev, Y., L. Kirilov. Decision Making Solutions for Implementing the Information Technology Infrastructure Library (ITIL). Proceedings of International Conference Automatics and Informatics (Ed. M. Petrov), Sofia, Bulgaria, October 2014, Sofia, Bulgaria, 2014.

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