Abstract: Although information technology (IT) is taking significant role in businesses with its innovating and supporting potential, it seems that it is least understood company asset. Successful organizations manage IT function in much the same way that they manage their other strategic functions and processes. This in particular means that they understand, manage and systematically measure the quality of IT performance. They are doing so by engaging in IT Governance and IT Audit activities. In recent years there are number of world-wide used standards and best practices in IT process management area such as CobiT and ITIL, which helps management to measure the IT performances. In this paper we present the case study of managing IT services in finance industry by implementing suggestions which arises from ITIL methodology. After brief explanation of key terms, the methodology of complex ITIL implementation project is given and key performance indicators for major IT related business processes stressed.

Keywords: IT Performance, IT Governance, IT Audit, ITIL, case study

1. Introduction

In today’s highly competitive business environment, effective and innovative use of information technology (IT) has the potential to transform businesses as well as to positively affect organizations performance. A number of researches showed that intensive use of IT which is particularly aligned with business strategy can provide number of opportunities and actual benefits to companies of all activities and sizes [8]. A good, or rather, inevitable approach for measuring the performance of IT should include thorough audit of all aspects of IS and IT, including hardware, software, data, networks, organization and key business processes. The primary goal of the information system audit (IT audit) is to systematically, thoroughly, and carefully examine the IT processes, to measure the IT performance, to warn about possible omissions and risks, and thus examine the quality of the company's information system [1], [4], [5]. This in particular mean that by engaging in IT auditing process companies can periodically measure the IT performance using well-proved, world-wide frameworks such as CobiT, ITIL, ISO 27001, etc. Such tendencies are mostly motivated by specific regulatory pressures (for example, Sarbanes-Oxley act, Basel II framework, etc.), rather than by IT value-added initiatives and may result in major business process change initiatives. The main objective of this paper is to analyse the implementation of ITIL methodology in IT service management process in financial industry. Having in mind that ITIL compliance projects are relatively rare and the ‘inside story’ implementation details are hard to get, this paper could be of major interest for researches as well as for practitioners and managers.
2. Methodologies and guidelines for IT Audit and IT Governance

IT Governance represent the organizational capacity exercised by the Board, executive management and IT management to control the formulation and implementation of IT strategy and in this way ensure the fusion of business and IT [5], [7]. In recent years various groups have developed world-wide known IT Governance and IT Audit frameworks and guidelines to assist management in managing and measuring the performance of IT initiatives. Contemporary frameworks are:

- **CobiT (Control Objectives of Information and related Technology),**
- **ISO 27000 ‘family’ (ISO 27001:2005, ISO 27002:2005),** and
- **ITIL (IT Infrastructure Library).**

While ISO 27000 family refers mainly to information security issues and surely can’t be treated as a comprehensive IT Governance ‘tool’ (rather as a leading information security norm), CobiT is the widely accepted IT governance framework organized by 34 key IT processes (or control objectives), which are broken into more than 300 detailed IT controls [2]. For each of the 34 IT processes CobiT defines:

- performance goals and metrics (for example, RPO, RTO, availability time),
- KRI (Key Risk Indicator), KPI (Key Performance Indicator)
- maturity models (0-5 scale) to assist in benchmarking and decision-making for process improvements,
- a RACI chart identifying who is Responsible, Accountable, Consulted, and/or Informed for specific IT process.

While CobiT gives comprehensive approach to all IT Governance activities, some key processes, namely in IT service area may be also found in ITIL recommendation. ITIL (Information Technology Infrastructure Library) developed and published in late 1980s by Central Computer and Telecommunication Agency (CCTA), now the British Office of Government Commerce (OGC), becomes widely embraced in private and public sectors as a reference framework for IT Service Management.

The main focus of our interest in this paper is the case study of ITIL implementation in Croatian financial services industry. ITIL is a series of books representing a repository of best practices in IT service management and related processes, promoting business driven approach to the management of IT and a performance driven approach in achieving business effectiveness and efficiency in the use of IS and IT. Basic ITIL process’ objectives are:

- to define service processes in IT organization,
- to define and improve the quality of IT services,
- to understand and improve IT service provision, as an integral part of an overall business requirement for high quality IS management,
- to ensure that the customer has access to the appropriate services to support the business functions.

Since the 1980s there were 3 major revisions of ITIL best practices. Version 2 described 11 major IT service areas within two broad categories of:

- Service Support – (Service Desk, Incident Management, Problem Management, Configuration Management, Change Management, Release Management) and
- Service Delivery – (Service Level Management, IT Financial Management, Capacity Management, IT Service Continuity, Availability Management).

New version 3 of ITIL brings evolutionary improvements to the IT Service Management concept, consisting of 5 key categories (Service Strategy, Service Design, Service Transition, Service Operation, Continual Service Improvement)1, but the supported processes remains the same in its core as in ITIL v2.

3. ITIL methodology adopted – what does it really mean?

Strictly speaking, ITIL itself isn’t a ‘standard’, but the best practice processes promoted in ITIL support and supported by the ISO 20000 from the International Organization for Standardization, which is presently the only standard in IT service management (alongside with equivalent BS 15000 from British Standards Institute). When organizations claim they have adopted ITIL framework, they usually mean that they have implemented 11 processes described in Service Delivery and Service Support categories. This in particular means that, following ITIL best

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practices, they improve their IT service processes at the operational (Service Support) and tactical level (Service Delivery) and gain possible strategic benefits such as:
- reduced costs and improved productivity of IT services provision,
- improved quality of IT services through the use of proven best practice processes,
- improved customer satisfaction through a more professional approach to service delivery,
- improved delivery of third party services through the specification of ITIL or ISO 20000 (BS15000) as the standard for service delivery in services procurements.

Therefore, it is quite necessary to set the wide range of key performance indicators (KPIs) to be able to manage the quality of changed or rather improved business processes\(^2\).

Apart from the certification possibilities or at least ISO 20000 and BS 15000 compliance in IT service management processes, a number of ITIL 'checklists' are available for self-assessment of current practices and benchmarking with best practices\(^3\). These metrics describe each ITIL process and practice in further details and enable companies to internally audit and assess the maturity of IT service processes (marks are on 1-5 scale for each IT process or activity). Also, a quantitative functional model, applied as a complement to ITIL, can show where implementing ITIL will yield a return, and whether and to what extent ITIL processes have resulted in performance improvements. Therefore, it is quite obvious that a certain activities need to be perform prior to ITIL implementation, which explains why there are limited number of companies engaged in ITIL implementation projects. Such companies manage IT in better way than their competitors, and they are aware of the fact that IT is not the subject, but the object of their business strategy. Therefore, for such companies there is a growing need for implementing contemporary IT Governance and IT Audit concepts.

4. The case study company profile

Operating in Croatia on more than 100 locations with 5000 employees, Company offers financial services for Croatian commercial banks, the Croatian National Bank, numerous business systems and other entities in the business environment. Although the Company is owned by the State, it operates exclusively on the market principle. Company is also the Government’s partners in the field of public finances where they implemented several comprehensive and vital projects. Company has also played an important role in the operational preparation and implementation of two major reforms: payment transactions and the pension system. Due to its size and financial capabilities, the Company has an important position on the Croatian market.

However, smaller and more flexible companies arising on the market are increasing their market share. Some of them are becoming significant competition to the Company. As the Company provides services mostly in a financial industry and at financial markets, it needs to improve the quality and efficiency of customer services.

Company’s IT department with 130 employees is supporting almost 100 different services of internal and external customers. Many of these customers demand 24x7 services and Company should be able to respond quickly and effectively on all customers’ IT infrastructure failures.

In order to increase the quality of its customer services, Company recognized the need to set up adequate IT processes and the tools for IT processes automation as well as to train their employees in the sense of establishing the right attitude and skills which should enable proactive support of IT services. Company realized that if it increases customer satisfaction, it will get better reputation on the competitive market. These facts and needs set the context for launching of IT Service management program in 2006. The Company believed that adoption of ITIL framework would help improving its processes.

5. ITIL implementation: analysis of the current practice and project steps

Prior to ITIL implementation the Company faced many problems, e.g. the lack of quality control, undefined communication among people in IT department, undefined change execution, repeated tasks and unrecognizing goals from IT staff point of view. Also, many of realized IT investments were based not on the Company’s strategic business objectives, but primarily on technological recommendations from different vendors. In a number of occasions IT engineers,
not the business process owners suggested investments in order to increase availability of IT infrastructure but not being aware if there could be a return to such investments in next period, or if these investments are agreed with customers (not to mention any compliance to valid SLAs – Service Level Agreement obligations). It was obvious that the business strategy and information strategy were not aligned, and moreover, that the technology strategy, not the business objectives drive the information strategy or the strategy of IT department.

**Pilot project**

After external consultants performed strategic IT audit, particularly in the field of the business/IT alignment, one of the recommendations in IT Service area was to implement ITIL methodology. After Board decided to implement ITIL, they initiated a pilot project of measuring and improving quality of two services which Company is providing to internal customers. This approach was suitable because any disruption, mis-functionality or mistake can cause problems only to internal customers and was good exercise for further services. Firstly, they started with processes from ITIL Service Support domain. The implementation process itself was divided into two phases:

1. in first phase Service desk, Incident Management and Configuration Management processes were implemented;
2. in second phase they continued ITIL implementation with Problem Management, Change Management and Release Management.

Before ITIL implementation, Company gained ISO 9001 certificate which helps them in designing adequate business processes. Furthermore, for each process they defined responsible team leader, who should become process manager after implementation. Also, outsourcing partner helped them a lot with best practice, knowledge and experience in their previous ITIL projects. Outsourcing partner implemented tools for business processes automation. Good decision was that implementation of tools came after they design ITIL processes.

**Education**

On the very beginning of the pilot project Company realized that they need to develop education program for ITIL implementation. Proprietary knowledge about IT, which Company has, is deeply embedded in IT department but poorly documented, difficult to adopt and transfer to other employees. According to ITIL v2, all people involved in ITIL implementation finished basic education and achieve ITIL foundation Certificate. IT Manager and his deputy achieve high level of ITIL education, ITIL Service Manager Certificate. From their experience, it’s no doubt that without proper education, the ITIL implementation project wouldn’t be successful.

**Side effects and problems during implementation of ITIL**

Every project in which you make major changes in organization or try to set up new processes is difficult to implement. IT management faced a lot of them but successfully passed through. Firstly, they realized that new system needs to be accepted by the Company’s management board. Due to the low position in organization hierarchy, IT staff used to listen to their superiors, instead of following new implemented ITIL processes. So, management board promoted the IT department in strategic business function and announced a policy for conducting business processes which was based on ITIL and was mandatory for all staff. Implementation creates lot of new documents and handbooks which threat to bureaucratise organization. For example, people in 2nd level service support gets handbook on more than 100 pages. It was a hard for them to follow such suggestions and management quickly decided to make new, simpler documentation. After implementation of ITIL, management board realized that costs become more transparent and some costs which were previously hidden suddenly became transparent and visible. It, of course, causes problems due to reactive attitude by certain employees. After several meetings IT management explain to business process representatives that overall achievements and benefits are much higher than disadvantages and argue management to continue with project.

There were also some problems during implementation caused by outsourcing partners and software vendors, especially in the area of ITIL processes automation. For example, when auditing the quality of asset management IT processes, it appears that quality of supported software was very poor and lacked the functionality. Therefore, vendor released new version with improvements based on IT audit findings. Similar scenario repeated when
auditing a software tool for automation of Service Desk. It appears that the tool hadn’t web interface for client who is working within, what was huge problem in distributed environment. Such problems slow down project implementation and required management competence and commitment to resolve them.

**Table 1. KPIs for ITIL process Incident Management**

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

6. Case study results and KPIs for managing IT services quality

In order to get results from ITIL implementation and to gain improvements on changed IT procedures and IT processes, for each of them the Company needs to set Key Performance Indicators (KPIs). For each process KPI represent a goal which the Company needs to achieve. These KPI’s were:

1. For Service Desk and Incident Management:
   a. Average time for solving incidents
   b. Percentage of total number of incidents which were solved on first level support
   c. Percentage of total number of incidents which had mayor impact on services
   d. Percentage of total number of incidents which were received beside Service Desk.

After Company made agreement what KPI’s are needed to monitor improvements, for each process they measure the performance before ITIL implementation, in order to compare them with results after implementation (in tables 1. to 4. the comparison are demonstrated for each process). All results are based on data which were collected in three months time after the ITIL implementation.

2. KPIs for Problem Management process are:
   a. Number of mayor problems
   b. Number of repeated problems
   c. Average time for diagnose problems and discover root cause of problems
   d. Percentage of solved problems which were solved proactively and reactively

**Table 2: KPIs for ITIL process Problem Management**

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

3. For Configuration Management KPIs are:
   a. Percentage of CI’s with wrong attributes after checking
   b. Percentage of CI’s which is written in Configuration management database in comparison with all other which is not written
   c. Percentage of CI’s which attributes are update automatically

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4. Configuration Management Database (CMDB) is defined as a database that contains all relevant details of each CI and details of the important relationships between CIs. Source: CCTA (2000).
Table 3. KPIs for ITIL process Configuration Management

<table>
<thead>
<tr>
<th>KPI</th>
<th>Before ITIL impl.</th>
<th>After ITIL impl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of CI's with wrong attributes after checking</td>
<td>65%</td>
<td>25%</td>
</tr>
<tr>
<td>% of CI's which is written in Configuration management database in comparison with all other which is not written</td>
<td>10%</td>
<td>70%</td>
</tr>
<tr>
<td>% of CI's which attributes are update automatically</td>
<td>10%</td>
<td>55%</td>
</tr>
</tbody>
</table>

4. For Change Management processes KPIs are:
   a. Percentage of changes which are realized as was planned
   b. Percentage of released changes but not approved
   c. Percentage of urgent changes
   d. Percentage of unsuccessfully realized changes

5. For Release Management KPIs are:
   a. Percentage of used software which are unauthorized
   b. Percentage of wrong releases
   c. Percentage of urgent releases

Table 4. KPIs for ITIL processes Change Management and Release Management

<table>
<thead>
<tr>
<th>KPI</th>
<th>Before ITIL impl.</th>
<th>After ITIL impl.</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of changes which are realized as was planned</td>
<td>25%</td>
<td>80%</td>
</tr>
<tr>
<td>% of released changes but not approved</td>
<td>10%</td>
<td>95%</td>
</tr>
<tr>
<td>% of urgent changes</td>
<td>60%</td>
<td>35%</td>
</tr>
<tr>
<td>% of unsuccessfully realized changes</td>
<td>18%</td>
<td>6%</td>
</tr>
<tr>
<td>% of used software which are unauthorized</td>
<td>22%</td>
<td>8%</td>
</tr>
<tr>
<td>% of wrong releases</td>
<td>13%</td>
<td>10%</td>
</tr>
<tr>
<td>% of urgent releases</td>
<td>32%</td>
<td>20%</td>
</tr>
</tbody>
</table>

Results provided in tables 1.-4. undoubtedly show to what extent Company improved their key business processes after ITIL implementation. KPI’s represent processes goals, but periodic IT audit activities enable the Company to measure the level of improving process performance. In some cases, results show significant improvements soon after implementation and demonstrate how ITIL methodology should help in effectiveness of IT processes which serves as one of the main enabler of business processes.

7. Conclusion and implications

In this paper we present a case study in which ITIL methodology was successfully implemented in a financial industry. A result based on set of KPI’s showed the exact and measurable improvements the Company achieved. Besides direct benefits, some indirect benefits were also discussed. To constantly measure the level of IT performance, companies have to engage in periodic IT audit activities. On the other hand, recent research studies reported that management awareness and commitment to periodically perform IT audit is quite low [4]. Such tendencies are certainly not so unexpected, when rare IT professionals and CIOs (Chief Information Officers) do understand the contemporary IT Governance and IT Audit concepts and are capable of presenting its ‘business value’ to the senior and corporate management. Therefore, once again we summarize and emphasize the results and direct and indirect benefits from ITIL implementation:

1. Implementation of ITIL improved the quality of IT services which Company provide to customers. Offering superb and reliable IT services gives the Company possibility to differentiate on the competitive markets, as well as to improve their business model.

2. After each implemented ITIL process, day to day work procedures were improved. People get concrete tasks and role in process. Knowledge base is in use and helps them to solve lots of incidents on first level support and let specialist free of simple and repeating issues. For each implemented process there is Key Performance Indicators which shows the process performance metrics. These positive effects resulted in better employee satisfaction and changed organization culture. Also, IT department in the Company becomes more confident in its ability to align with the business, to adapt to change, manage risk and deliver excellent services.

3. Support from Management board is
necessary. Without real support and commitment of high-level management it’s very hard to successfully implement ITIL and other IT compliance projects. Management must be included in all strategic decision and have to help in creating framework in which new processes can develop, maintain and continually improve.

4. Education is key point of ITIL implementation. The ITIL foundation training — undertaken by more than half the staff — eased communication problems by giving its participants a common vocabulary and reference. The most responsible persons for ITIL should get highest level of education in order to better manage their people and implemented processes.

5. Before buying software for automation processes, IT had to make thorough IT audits, which in particular means deep feasibility and functionality analyses of the software and its possibility to integrate with current IT infrastructure. Any other inconsiderate approach can slow down project and bring a lot of problems.

8. References


