Planning to Implement Continual Service Improvement processes

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Abstract. *ITIL (Information Technology Infrastructure Library) standard ensures a consistent best practice concept for setting up the IT service management processes (ITSM) built into the IT organization. The quality of IT services for business support depends on the planning, implementation, measuring, analysis and continual improvement of the IT service management processes. ITSM plans and the quality process control throughout all stages of the life cycle of IT services are key to improving ITSM processes and raising their maturity level. The goal of the paper is to analyze continual service improvement (CSI) principles, processes, methods. Furthermore, it is important to consider and present the basic ideas for planning the implementation of CSI processes using the ITIL standard as well as the application of CSI to services and service management processes.*

Keywords. ITIL, IT Service Management (ITSM), Continual Service Improvement (CSI) principles, Planning and Implementation of the CSI processes.

1 Introduction

ITIL (Information Technology Infrastructure Library) ensures a consistent best practice concept for setting up the IT service management processes (ITSM) built into the IT organization. ITIL provides guidance for managing IT processes, IT infrastructure, IT services with focus on *monitoring their performance, the necessary correction and continuous improvement.* Defined metrics for monitoring performance of IT processes and IT service quality resulting from the business (technical) and the user perspective. Processes and functions within the life cycle of IT services according to ITIL V3 standard are shown on Fig.1 [2].

The goal of the paper is to analyze **two critical aspects related to Continual Service Improvement (CSI)** processes: *generic model for the planning of CSI implementation,* especially the factors that IT organizations should consider during this planning, as well as *the application of CSI to services and service management processes.* The paper is analyzing the CSI application to the example of SLM process using the balanced scorecard (BSC) method. Considered aspects of the CSI's are based on the PDCA approach.
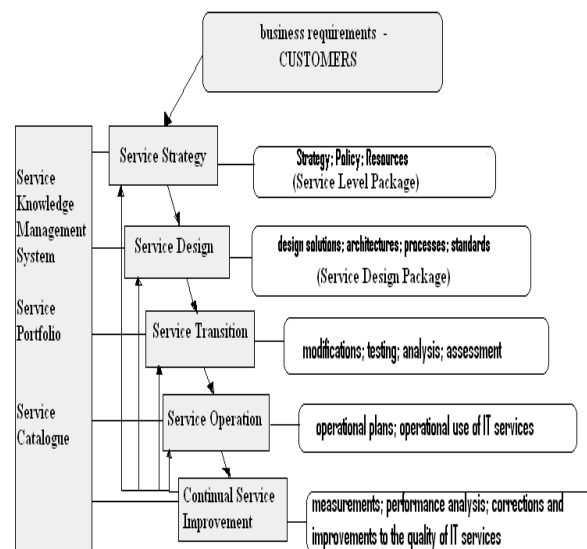

Figure 1. Life cycle of IT services

Business requirements arising from the business strategy initiate the lifecycle of IT services. IT organizations as a service provider must identify users of their services not only to support business processes, but also for business development and innovation. The result of the

strategic planning phase is the service level package.

Service Design phase creates all the necessary solutions for the implementation of IT service and develops the Service Design Package.

Service Transition phase of evaluation and testing of IT services for operational use is the next step within the life cycle of IT services.

The primary purpose of CSI is to continually align IT services to the changing business requirements by identifying and implementing improvements to IT services that support business processes. CSI processes (activities) support all stages of the lifecycle of IT services. ITSM processes should be continuously monitored and improved in accordance with the CSI program.

2 PDCA approach as the key principle of the CSI processes

For quality improvement Deming proposed the Deming Cycle. The four key stages are "Plan, Do, Check, Act" as the PDCA approach shown on Fig.2[4].
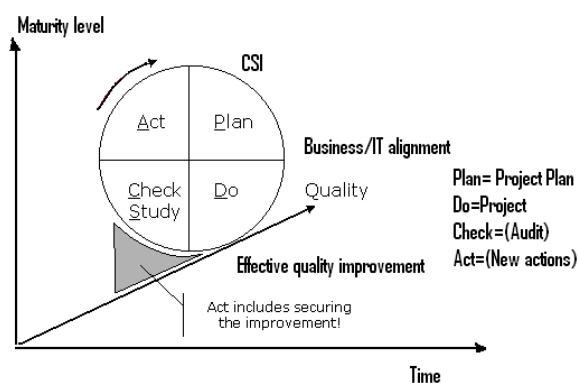

Figure 2. The Deming Cycle

The PDCA approach is important at two aspects in CSI: implementation of CSIs, and for the application of CSI to services and service management processes in order to increase their maturity. At implementation, all four stages of the Deming Cycle are used:
PLAN - planning CSI processes (activities), resources and CSI control (objectives; critical success factors (CSFs); key performance indicators (KPIs); responsibilities);
DO – implementation (execution) of the CSI processes;
CHECK – monitoring and evaluation of the CSI processes

ACT – implementation of the corrective actions and development of the improvement initiatives for increasing the CSI maturity.

The PDCA approach is also used for the application of CSI to services and service management processes, e.i. for the improving services and service management processes. The check and act stages are very important to *monitor, measure, review and implement initiatives*. ITSM processes are monitored as well as their results, the reports on the process maturity are created; in accordance with the gathered data and performed analysis, the requirements for the process improvement and the continual service improvement plan (CSIP) are created.

The end of each cycle is also beginning of the new cycle. After the act phase, there is a new measurement plan in order to achieve continual service improvement.

3 Planning the implementation of the CSI processes

CSI activities should be planned. These activities become the process such as other ITSM process within IT organization (defined activities, inputs, outputs, resources, process control).General model for planning the implementation of the CSI processes is shown on the Fig.3.
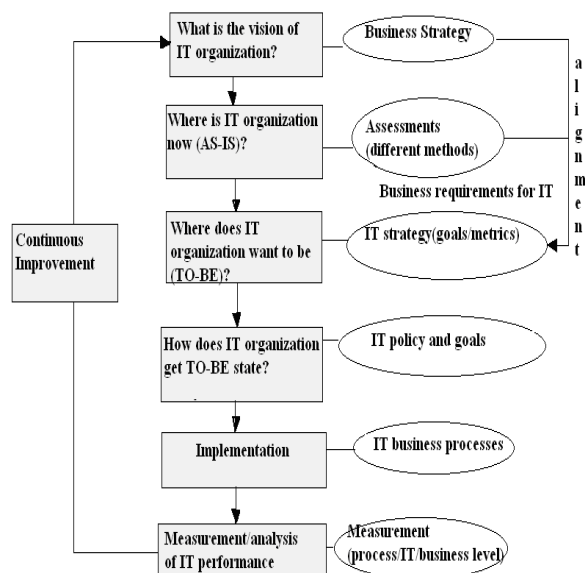

Figure 3. Generic model of the planning the implementation of CSI processes (activities)

Starting point in the model is the vision and strategy of the IT organization. Value-based

measurement and continuous improvement of IT services requires an IT organization to implement activities based on what they want to accomplish, not on what they want to measure. Each of ITSM processes has defined quality plans and key performance indicators. The model is based on the PDCA approach - *plan the purpose of the process in such a way that the process action can be audited for successful achievement and improved* [3].

A service management vision is the agreed statement of „Where does IT organization want to be?" that is formulated by the business and IT together by looking at their forward business objectives. The vision should describe the aim and purpose of the continual service improvement program (CSIP). It has to include all aspects of the program: *people, processes, technology.*

„Where is IT organization now"– in this analysis, IT organization has to analyze the following important questions:

a) Whether IT organizations understand the business strategy and technological potential that is required to support the implementation of business strategy (*business and technological aspects of the analysis*)?

b) What is the current role and level of maturity of the IT organization in relation to these aspects (*IT goals, IT process maturity, competence and knowledge of IT personnel, technological level, the level of culture and readiness for the realization of the role of IT in business*)?

Assessment of the current situation it is necessary to define a clear IT strategic goals, generated from the business strategy and metrics to monitor achievement goals. Furthermore, it is necessary to identify and establish appropriate IT processes that will realize IT goals in line with business strategy.

„Where does IT organization want to be" – previous assessment and analysis of the current state of IT organizations, in this phase is of fundamental importance to clearly define the IT strategy, goals and their metrics, and make IT a strategic plan that is the plan of implementation of IT strategy. After IT organizations define strategic goals and plans, the question is how to achieve. Many IT organizations make mistakes in CSIP programs because they are trying to achieve based on past experiences.The basic model of ITSM process shown on Fig.4 [3].
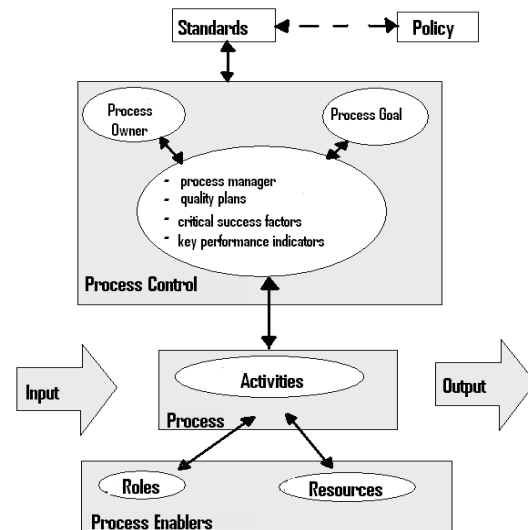

Figure 4. Generic model of the ITIL process

The answer to the question of „How to achieve TO-BE state lies in the structure of IT organizations based on integrated IT processes, which requires adequate planning in line with the priorities defined in strategic plans. CSIP program covers all ITSM processes within the life cycle of IT services.

3.1 SLM process as the key process for the CSI planning and implementation

Service Level Management (SLM) process is the key process for all ITSM processes as well as for the CSI program. Fig.5 shows the SLM activities within the SLM workflow diagram as well as the relevant output documents.
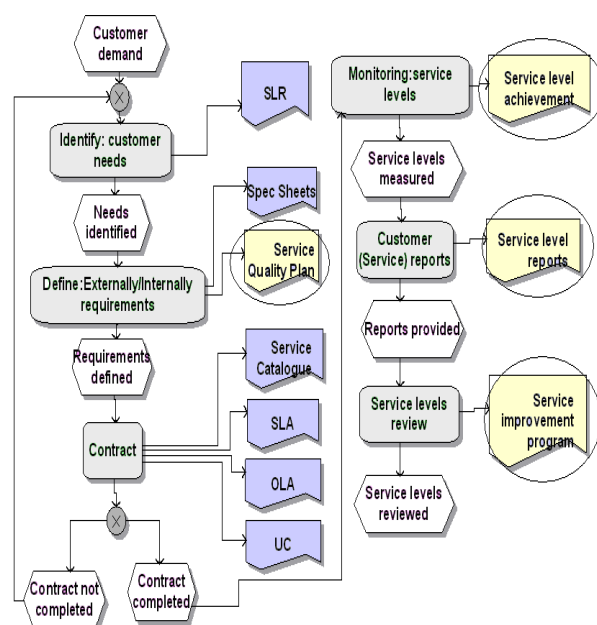

Figure 5.SLM workflow diagram (source:Authors)

According to the SLM workflow, based on the PDCA approach, the following activities/documents are essential for CSI: *defining the service quality plans*; *defining the contracts; monitoring the service level performance and creating the reports; creating the continual service improvement program (CSIP)* [6].

SLM includes the following important activities (shown on Fig.5):

- identifying the customer's needs and understanding their business processes and strategy;
- defining the services to be provided to meet the customer requirements; these services are defined in SLR documents, and their technological specification is defined in Spec Sheets documents; SLM process defines the quality plans for IT processes in order to provide the quality of IT services in accordance with SLA documents;
- negotiating with the customer about the required services in relation to costs, quality, response time, availability and other requirements; output of this activity are SLA documents, OLA and UC contracts;
- monitoring the service level performance;
- reporting to the customer and the IT function about the service level achievements;
- reviewing the service in order to define the opportunities for improvements; there is a need for the implementation of the CSIP; this may result in modified or new SLA documents.

3.2 Key attributes for the CSI planning and implementation

Achieving value-based measurement and continuous service improvement requires an IT organization to implement activities based on what they want to accomplish, not on what they want to measure. According to ITIL framework and ITSM in general, the primary accomplishment of IT should be the effective alignment of services with the current and future needs of the business and its customers. Therefore, following are some key attributes that should be considered during the plan-do-check-act lifecycle of CSI: **processes, people, technology and management.** Their inter-dependability is shown on Fig. 6 [4]. These factors are also essential for the planning of other ITSM processes as well as for the overall reengineering of IT organization.
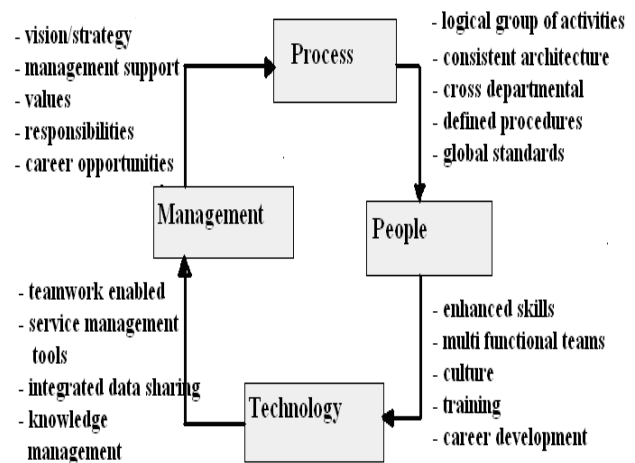

Figure 6. Key drivers for CSI planning and implementation

The success of any measurement program will depend on how *management* aligns the *people, processes and technologies* that enable the vision. The future state of any measurement program should be clearly outlined. Activities that are not value-based should be stopped immediately. IT measurement is primarily built around people with clear roles and responsibilities to ensure accountability and efficiency. Just like the core IT service support and delivery processes, the IT measurement process should also be structured and documented. Furthermore, communication is required for measurement efficiency and ensures the entire organization understands and supports the program. All metrics should be developed, captured, measured, reported and reviewed in a consistent fashion, supported by standard processes and policies. The metrics and measurement activities should be also monitored and improved with the support provided by the knowledge management.

Measurement results should be reported on a consistent basis and used as an input for prioritizing the service improvement program in order to add real business value.

4. The 7-Step Improvement Process

Starting from the vision, mission and operational goals of business / IT organizations, the 7-Step Improvement Process provides concrete assistance in the implementation of process improvement. These steps are shown on Fig.7 [7].
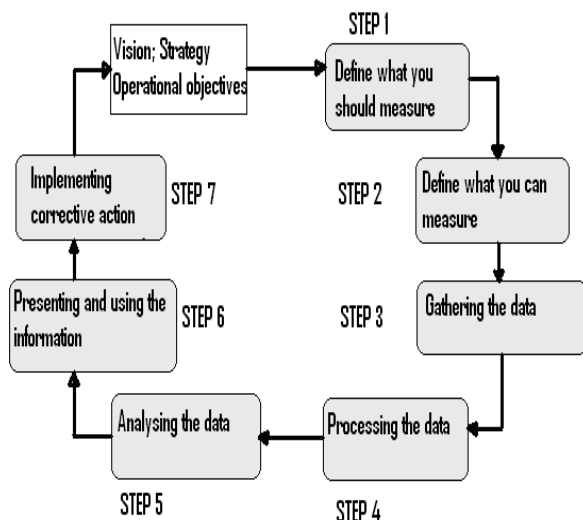
Figure 7: The 7-Step Improvement Process

It is crucial not to skip any step, especially first and second, which are crucial for proper implementation and evaluation of the following steps. A common mistake is to skip them, either because they are not planed, and everyone knows which data they already have, or because the IT organization thinks they know everything better and don't require any conversation with the costumer. The result of their skipping is seen after step 6: data in the reports, that is incomplete, too wide, unusable and/or do not give a true picture of the AS-IS situation, as well as no proper guidance to achieve TO-BE situation.

4.1 Step One – Define what you should measure

Business requirements determine the criteria that should be measured. At the beginning, a list of what is relevant to the process that we want to improve should be determined. It is important to choose those metrics that are relevant, accessible, and necessary. Key sources of such information are defined in the service repository. In addition, each ITSM process has defined KPIs and key success factors as shown in Figure 4.

4.2 Step Two – Define what you can measure

In this step, it is important to conduct a gap analysis, in order to define what IT organizations should and what can be measured. Gap analysis is very useful because it allows IT organizations to estimate their costs, to perform a risk analysis, to define required level of knowledge and

responsibilities and the necessary technology (tools).

In every organization there are certain tools that are used in certain steps (service management tools, monitoring tools, reporting tools, investigation tools and others) and can be purchased or customized. The gap analysis results have to be presented to the IT organization and the customers.

4.3 Step Three – Gathering the data

Data collection has to be monitored by the process, the application, with help of tools, or in some other way. Because quality is the main goal of improving a process, data collection will not be oriented on the process flow presentation, but on the identification of those factors in a process that can and should be improved. The goal of CSI is not to state whether a problem is solved, but whether it is solved within the agreed terms, the agreed cost and whether it is possible to prevent its repetition. In case of monitoring a consistent process, the purpose of CSI is to find a way to improve it or its performance or to reduce costs in the future with the same or greater level of service. It is important to note that there are 3 types of metrics that the organization collects in order to support CSI activities and other process activities [7]:

- technological metrics - often associated with metrics based on components and applications (various performance, availability, etc.);
- process metrics - usually shown as CSFs, KPIs and metrics of activities in the process of service management (ITSM briefly within each process);
- service metrics - as results of end-to-end service, are obtained by calculating from technological and process metrics .

Data structure has to be standardized according to SMART (Specific-Measurable-Achievable-Relevant-Timely) principle, and to define the following [7]:

- Who is responsible for monitoring and gathering the data?
- How the data will be gathered?
- When and how often is the data gathered?
- Criteria to evaluate the integrity of the data.

Accuracy and meaning of the collected data has to be verified before presented to the most

important people in your organization. People who enter data may make mistakes, but those mistakes can be an indicator that something is wrong in the process of collecting data.

4.4 Step Four – Processing the data

Data processing is the transformation of raw data into information. Although data generally is collected and processed automatically, using tools, some data is still collected manually. Like data collection, processing has to be standardized too, and the format of information has to be customized to the purpose and to the recipient of the information.

Thus, about 99.90% and 99.95% availability of servers in a system can be a big difference in performance, although at first glance it does not seem so. Likewise, the mean value obtained from a set of 10 and a set of 50 data about a process can make a substantial difference.

4.5 Step Five – Analysing the data

Data for itself does not mean anything. To understand its importance, it needs to be analyzed. Number of solved problems or incidents in a quarter will not help much if we don't know their relation to correctly executed tasks, completed processes in this and previous periods. To analyze information and data, we have to know their significance.

Only when information and processed data are brought into relation with relevant data for that process, we can evaluate their effectiveness and efficiency. This applies to all metrics and processes that we have observed and measured. After this analysis we can decide about the way of presenting reports in a correct manner and form adjusted to the recipient. The analysis should show where the bottlenecks in the process occur, whether goals defined at the beginning were achieved, and whether and which new goals can be set for a new cycle, how they will be measured using what metrics. CSI analysis needs to transform collected data and information into knowledge about the processes that we have observed.

4.6 Step Six – Presenting and using the information

The way of presenting information and proposals should be adjusted to the recipient. This means that the format of presentation (tables, PowerPoint presentations, a written report in Word or some other form), and the amount of information, should be adjusted according to whether information is presented, and to what levels of management in the business/IT organization, to external customers or suppliers, or to someone third, and not shared linear.

4.7 Step Seven – Implementing corrective action

Proper implementation of step 6 can be very crucial for the implementation of activities needed to improve the process. If you have presented the suggestions for improvement in the right way to key individuals who are responsible for making decisions relevant to these processes, and they decide that these processes need to be improved in that way, then the main goal the CSI method is fulfilled and a new process life cycle can start.

5 Balanced Scorecard as the CSI method used on the example of the SLM process

In previous chapters emphasized that the quality of IT services depends on the planning, implementation, measuring, analysis and continual improvement of the IT service management processes that support these services. ITSM plans and the quality process control throughout all stages of the life cycle of IT services are essential to improving the ITSM processes and raising their maturity level.

IT organization has to find the adequate method of measuring the service level performance within each phase of the service lifecycle. First, in the developing a service measurement framework, IT organization has to understand the business processes and the most important services as the business support. The IT goals must support the business goals.

Further, IT organization has to define the key elements that should be monitored and measured in order to determine the balanced perspectives. Everything must be aligned with business/IT strategy. The key elements that should be defined for the service measurement framework are: *services, ITSM processes that support the services, activities within the process and key outputs* (*such as user perspective and business contribution perspective*).

Based on the adequate service measurement framework, IT managers can make decisions about the implementation the service improvement actions.

The chapter analysis the application of the balanced scorecard method (BSC) to the SLM process within Service Design phase.

This method provides the adequate planning, implementation, measuring, analysis and continual improvement of the SLM process and its outputs. It can apply as the service measurement framework to all ITSM processes within the life cycle of IT services. The integrative approach of the BSC is shown on Fig.8[1].
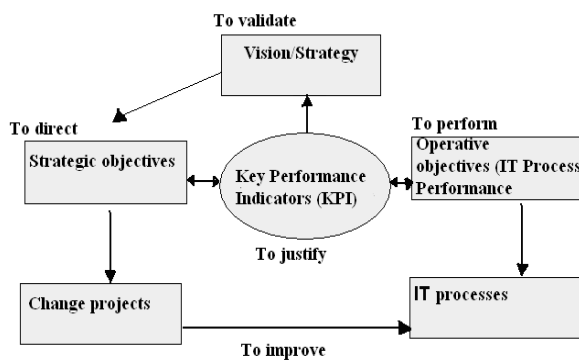

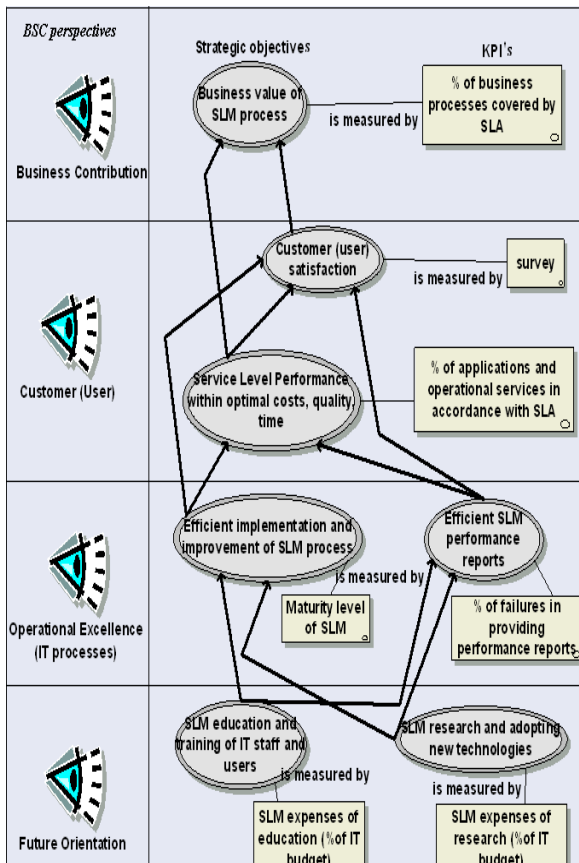**Figure 8. Integrative BSC approach**

Figure 9. BSC strategy map for SLM process (modelled by ARIS BSC tool, source: Authors)

The key objectives and KPIs for the SLM planning, measurement and management are defined within four perspectives, shown on Fig.9.

This map encompasses the main SLM strategy objectives and their measures, and shows the important the cause-effect relationships between leading perspectives (*future orientation and operational excellence*) and lagging perspectives (*customer and business contribution) as the key outputs*[8].. SLM education and new technologies are the performance drivers to achieve the quality and maturity of SLM process that in turn is a driver for optimal service level performance and increased customer satisfaction that will lead to a higher business value of SLM process (business contribution).

Fig. 10 shows how organizations can plan the needed resources for the SLM implementation. This figure shows the resource allocation for the strategic objective – *efficient implementation and improvement of the SLM process* (from the SLM BSC map shown on Fig.9). On this way, each strategic goal from the BSC map can be allocated with needed resources in order to achieve the quality performance.
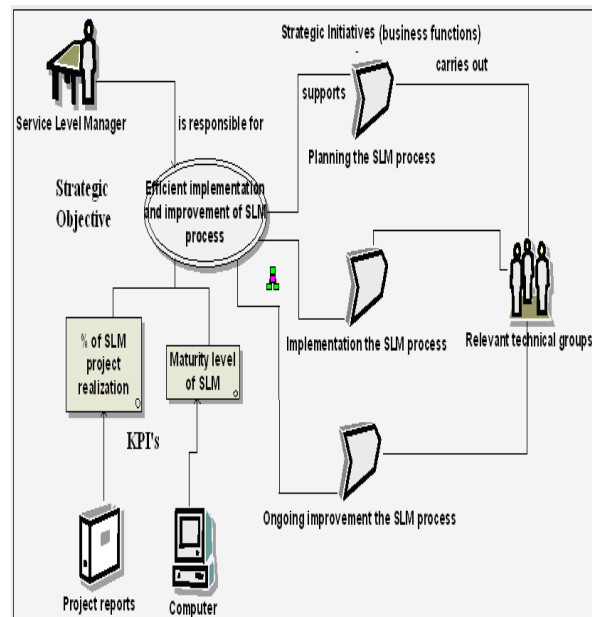

Figure 10. SLM BSC performance allocation diagram (modelled by ARIS BSC tool, source: Authors)

What is essential for the service level performance measurement? The whole measurement framework should be integrated into business planning and focused on business and IT goals and objectives. ITSM objectives and their metrics (KPIs) should be defined and

balanced within the perspectives in accordance with the IT strategy.

Metrics should be well defined, clear, relevant to meeting the objectives in order to provide IT managers with useful information to make strategic, tactical and/or operational decisions related to service improvement.

Furthermore, IT organization should well determine roles and responsibilities in the process of defining objectives and metrics; monitoring, data collection, analysis and reporting.

4 Conclusion

The quality of IT services for business support depends on the planning, implementation, measuring, analysis and continual improvement of the IT service management processes. In accordance with this, the paper analysis two important aspect of CSI processes: how to plan the implementation of CSI activities and which factors should be considered within the planning, and how to apply the CSI to services and service management processes.

Planning to implement the CSI is very complex task that requires the alignment between the people, processes and technologies provided by adequate management. Like any ITSM process, CSI should also have a purpose, and the future state of any measurement program should be clearly outlined and aligned with the business/IT strategy. CSI processes should be also documented, monitored and improved. The basic model for the CSI planning is shown on Fig.3.

In the application CSI to other ITSM processes, it is important to apply adequate and consistent methods that will include all key elements for monitoring, measuring and evaluation. What are the key elements? The BSC method has the integrative approach that includes such elements through the four perspectives: knowledge and technology; ITSM process level performance, service level performance and user satisfaction and at end the business contribution.

The paper describes the application of the BSC method to the example of the SLM process according to ITIL standard. Based on the adequate service measurement framework, IT managers can make decisions about the implementation the service improvement actions.

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