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MONITORING IT SERVICES FOR SUPPORTING BUSINESS PROCESSES

Jorge Manuel de Oliveira Vicente

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Júri

Presidente: Professor Alberto Manuel Rodrigues da Silva

Orientador: Professor Miguel Leitão Bignolas Mira da Silva

Vogal: Professor Luís Velez Lapão

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Abstract

IT drives to the goal of acting as a service provider to the rest of the business. However, responsible IT Service owners are challenged by the fact they often don't have a clear perspective of the business health of critical processes that their IT systems are supporting. Most event data from infrastructure management tools is IT-centric, and has little relation to relevant business conditions. By enabling IT to gain visibility and a better understanding of the condition of business services and processes that are key to the business, IT Service managers and service owners will have a better business perspective and the right level of knowledge to respond to, and negotiate with the business. The link between Business Processes and IT Services goes far as the granularity goes, and, it is proposed the relation between activities and transactions the bound that connects them. This relation can be used to measure costs and performance. Regardless the form that companies calculates this indicators, it's now possible to create bullet proof SLA reports that are non-repudiation efficient. Providers could in the future be obligated to respond for their performance and customers and users could be more satisfied with their IT Services since they will be aware the right price to pay and demand the right service-level.

Keywords: IT Governance, COBIT, ITSM, IT Service Monitorization, BPM

Resumo

SI direcciona para o objectivo de agir como um fornecedor de serviços para o resto do negócio. Em todo o caso, os responsáveis pelos SI são desafiados pelo facto de que normalmente não têm uma perspectiva clara da saúde de processos críticos para o negócio assim como dos sistemas que o suportam. Maior parte da informação e infra-estrutura é gerida por ferramentas centradas nos SIs, tendo pouca relação para as condições do negócio. Ao possibilitar que os SI ganhem visibilidade e uma melhor compreensão das condições dos serviços e processos que são chave para o negócio, os gestores e os fornecedores dos serviços de SI terão uma melhor perspectiva de negócio e o nível de conhecimento certo para responder e negociar com o negócio. A ligação entre processos de negocio e os serviços de SI vão até à granularidade vai, e proposto que a relação entre actividades e transacções sejam essa ligação. Esta relação pode ser usada para medir custos e desempenho. Independentemente da forma como cada empresa calcula estes indicadores, é agora possível criar relatórios consistentes de SLA que são resistentes à não repudiação. Fornecedores puderam no futuro ser obrigados a responder pela sua performance e os clientes e utilizadores estarem mais satisfeitos com os seus serviços de SI, a partir do momento que sintam que pagam o preço certo e tenham os níveis de serviço certos.

Palavras-chave: Governação de SI, COBIT, Gestão de Serviços de SI, Monitorização de Serviços de SI, Gestão de Processos de Negócio

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Acronyms & Abbreviations

BAM – Business Activity Monitoring

BAM – Millennium bcp Business Service Monitoring

BP – Business Process

BPM – Business Process Management

BSC – Balanced Scorecard

BSD – Millennium bcp Business Support Division

BU – Business Unit

CEO – Chief Executive Officer

CIO – Chief Information Officer

CMDB – Configuration Management Database

COBIT - Control Objectives for Information and related Technology

CSF – Critical Success Factors

IT – Information Technologies

ITGI – Information Technology Governance Institute

ITIL – Information Technology Infrastructure Library

ITIM – Information Technology Infrastructure Management

ITS – Information Technology Service

ITSM – Information Technology Service Management

KPI – Key Performance Indicators

MIS – Management Information System

NSS – Negotiation Support Systems

OSS – Operations Support Systems

ROI – Return On Investment

SLA – Service Level Agreement

SLI – Service Level Indicators

SLM – Service Level Management

SLO – Service Level Objectives

TMF – TeleManagement Forum

1. Introduction

In our days most of Enterprises could not survive without the help and support from Information Systems. For many Enterprises Information Systems represent their most value, but often the least understood assets. Successful enterprises recognize the benefits of information technology and use it to drive their stakeholders' value [1].

Regarding if most of IT in the Enterprise is Outsourcing or not, the alignment of Business Strategy and IT Strategy is required. According to Luftman, every business is an information business. Information is the glue that binds value chains and organizations by aligning Business Strategy and IT. Figure 1 illustrates Luftman's strategic Business/IT alignment model.

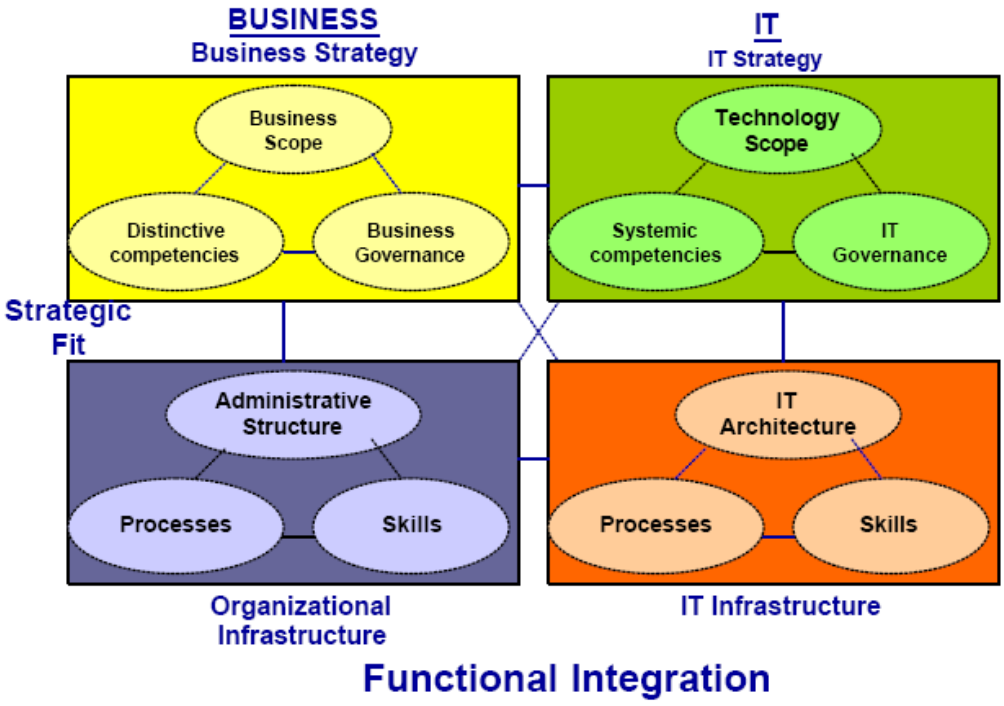

Figure 1 – Strategic Business/IT Alignment Model (source:[2]).

Strategic alignment should link business strategy imperatives with IT initiatives and services that are measurable.

1.1. IT Governance & IT Service Management

Thus, IT Governance is a topic of major concern to any Enterprise that use complex and vast systems that support their Business. There is a need to manage and control every aspect of these systems. Machines and man unified as one, so that a Business can change as fast as the Global societies do. If so, IT is a continue investment that Enterprises do, and like every

investment must have a return. So, CEO normally asked to himself: I'd invested heavily in technology but where is the payoff?

This is the main question that drives CIO's every day. Every meeting with the CEO is a quest to prove that investing in IT really pays off when Business needs to update, change or survive. This is a "war" that is far to an end, and CIO's have lost most of the battles. The difficult to measure and dived costs to its users is an issue that is on every CIO's agenda. Technology still's the worst nightmare to all the Companies that cannot survive without IT, since it's very hard to measure and with that, to manage. A "Black Hole" that always need more investment and seems out of control. A constant change that implicates a continue metanoia in peoples' minds.

In general, IT is defined by applications, network, infrastructure, machines etc. that when integrated creates Systems, Systems that support Business, and Business that have goals. The non accomplishment of these Goals, probably implicates the end to a Company. Thus, the need to create accurate tools that permits a successful IT Management increase every day. Methodologies and Frameworks where created to an effective Governance. Align IT with Business Goals is fundamental to a successful integration of Systems in a Company and its survival.

In this continues line, internal Clients make demands to a better and more complete set of tools from IT Systems every day, so that they can be more efficient and win in the specific Business.

On a CIO's point a view, this Systems reflects as Services in IT Governance. There are many variables that need to be defined so that the alignment between IT and Business is consistent and at the same time flexible to always be updated and align with Business Goals. With Globalization and the growth of competitiveness of Service Providers, Outsourcing gains a primary role on CIO's agenda. The reduction of costs that specialization brings is a sufficient issue to consider Outsourcing as an alternative to in-house production. In some cases, this alternative becomes the unique solution, when Companies do not have infrastructure or the capacity to do it itself [3].

When evolving from technology providers into strategic partners, IT organizations typically follow a three-stage approach as illustrated in Figure 2. In several cases, enterprises that contract IT Providers have the IT Governance and IT Service Management in-house, which can create problems when we need to be aligned with business goals.

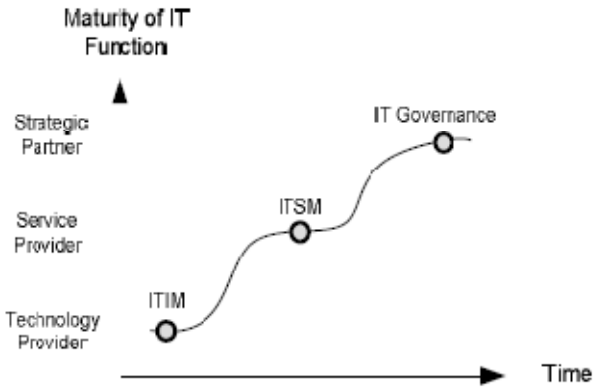

Figure 2 – Evolution of the IT Function within organizations (source:[4]).

The difference between IT Service Management and IT Governance has been subject to confusion and myths. Peterson provides us with a clear insight into the differences between these two notions. “Whereas the domain of IT Management focuses on the efficient supply of IT Services and Products, and the management of IT operations, IT Governance faces the dual demand of (1) contributing to present business operations and performance, and (2) transforming and positioning IT for meeting future business challenges”[5].

As depicted in Figure 3, Peterson suggests positioning IT Governance and IT Management along two dimensions, Business Orientation and Time Orientation.

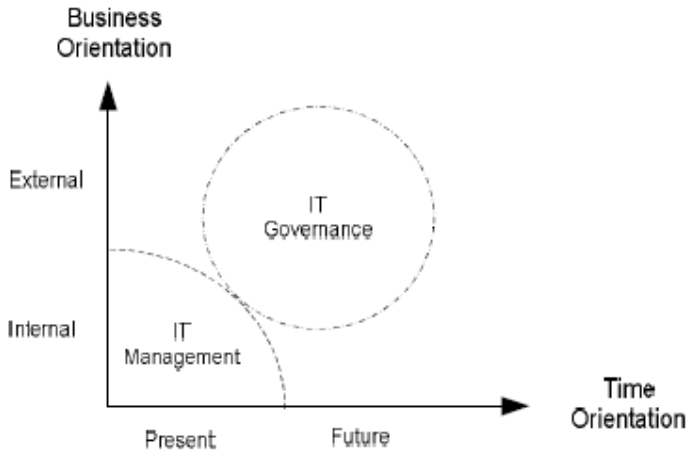

Figure 3 – IT Governance and IT Management (source: [5]).

IT Governance is the preparation for, making of and implementation of IT-related decisions regarding goals, processes, people and technology on a tactical or strategic level. The framework for defining IT Governance is employed to compare how IT Governance is defined in literature, and within a group of IT Governance experts. COBIT is the most well-known framework for IT Governance and it is frequently used by practitioners. While comparing

COBIT's definition of IT Governance to the previously identified concerns of literature and practitioners, it showed that COBIT does support most needs, but lacks in providing information on how decision-making structures should be implemented [6].

1.2. Service Level Management

In this quest are several issues that need attention, and one problem is already identified: the alignment between Service Level Agreements and IT Governance. IT Service Management integrates on IT Governance and must respond to an investment made in a Service that is bought and must proof that is a good investment. These Services must be aligned with one or more Business Goals and to do this alignment, metrics must be defined so that this management can be made. The Service Level Agreement is as contract that specifies the level of service that must be provided [7]. There are very roles on this negotiation and different views that have to be converged.

Service Level Management is often regarded as one of the most important management disciplines in IT Service Management, vital for customer-orientation and provision of high-quality IT Services. SLM is responsible for determining, monitoring and reporting IT Service quality metrics in line with the commercial business goals of the entire organization. It is important for an improved relationship between s service provider and costumer [8].

After the negotiation and the implementation, the "health" of a Service must be monitored. Business Service Monitoring normally provides the technological monitorization of the services, with the goal to see the Services as the Client and provide information that permits an overview of the Service and allows decision support when a problem and incidents occurs and data to foolproof reports to a possible re-negotiation of a Service.

ITIL is the most used framework on this matter and the academic programs also points ITIL as the best framework to teach in business-schools and Management Information Systems curricula in Universities [9].

In an ITSM point of view the information produced by SLM improves IT Services but in Business point of view, there is lack of information regarding how the ITSM performance integrates the Business performance.

1.3. Business Process Management

Any enterprise—corporation, government, or nonprofit organization—can be viewed as the sum of its business processes. Each process delivers value to customers, suppliers, employees, or other stakeholders. BPM, the discipline for enabling and automating business

processes, is in a period of rapid growth and will fundamentally change the way computing power is applied in organizations.

Whereas BPM has already delivered considerable value in many companies, the components of the full BPM solution are still evolving and are the subject of ongoing research and development [10].

Business Process Management is an old discipline that allows you to model the organizational structure, define the business processes, and show the interactions between them, from design to automation.

The whole point of automating business processes is to improve operations—in cost, time, or quality. Once a process has been developed and deployed, how can we know if it is meeting the intended goals? We know how to instrument IT systems and monitor them with a high degree of precision. These statistics, however, do not generally provide a business-process context around this information. The challenge is to aggregate and present execution data at the business-process level. Gartner coined the term business activity monitoring (BAM) for this capability. It defines BAM as providing “real-time access to critical business performance indicators to improve the speed and effectiveness of business operations.

Without BAM, operational managers have no way of determining whether the processes for which they are responsible are meeting their objectives [11].

1.4. Summary

Today a business process has some activities that have one or more service that fully supports them. If that service stops and we ask to the operational manager why, consulting a BAM dashboard it’s possible that he can identify the reason “pointing the finger” to the Service Manager. At the other side, the service manager and the Business Support team work in the way to solve the incident, and in the end, service manager congratulates himself and his team because they solve the incident rapidly maintaining the performance, but is operational manager satisfied?

Thus, we have two types of indicators that are sensible to an incident: the business-level and the service-level. But are they aligned? What is the cost of that service to both managers? What is the cost to the business when a service stops?

Normally we encounter 2 different visions (1) focus on the business processes (2) focus on the services. Regardless the business goals, it’s possible that the BPM and ITSM aren’t aligned.

Figure 4 shows the different views between business and services. A manager has a view concerned with business and with the objective to maintain business running no matter what

and with best performance possible. Thus, Service 1 failed! What is the implication with the business? Which processes are affected? And what can I do to keep the business running? I'm paying the right price for this Service 1? How many business processes are affected by this Service 1? Do I have the right Service?

Instead, service view is different. Service management is concerned with the resolution and management of the incidents and problems and with the objective to restore service as soon as possible. Thus, Service 1 failed! What is the incident? It's a problem? How can we solve this incident? When will be the service restored? It's our KPI's accomplished?

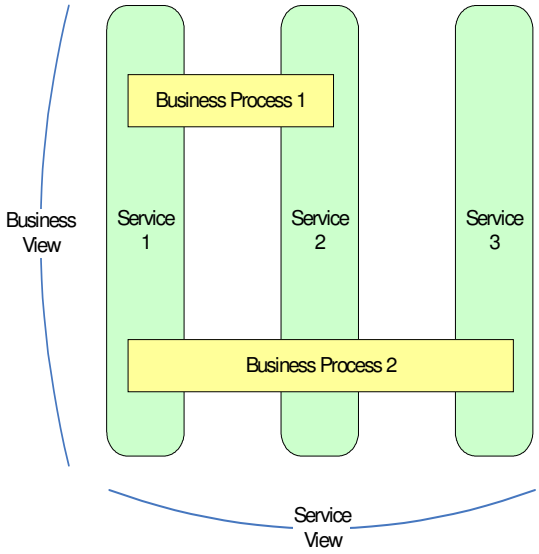

Figure 4 - Business view Vs Service view.

Each one of these views has different frameworks and different tools to monitor and support them. But there are needs to create a view from a top that permits to those who evaluates and choose services that support the business, which creates information to define the real value of a service and who is responsible to pay the costs, in a process-oriented way.

In 1996 Magill and his group of researchers stated that "While the importance of a mission statement is well understood by most organizations, the process from which the mission statement springs has been neglected. As organizations move toward tapping individual talent and commitment while empowering skilled individuals to respond rapidly to a changing environment, the bottom-up approach to mission creation is a natural step." [12].

This thesis is an approach to align these two levels of monitorization accordingly with the business goals, based on COBIT, ITIL and BPM and on the information provided by the service monitorization.

2. IT Service Level Management

2.1. Introduction

In Figure 5 is illustrated the know-how in each areas getter during the thesis. To achieve an acceptable result to this thesis, it was imperative to know well the area of IT Management and IT Governance as well COBIT framework and IT Service Level Management and ITIL framework, in a way to comprehend and gather the better information to deliver to operational managers

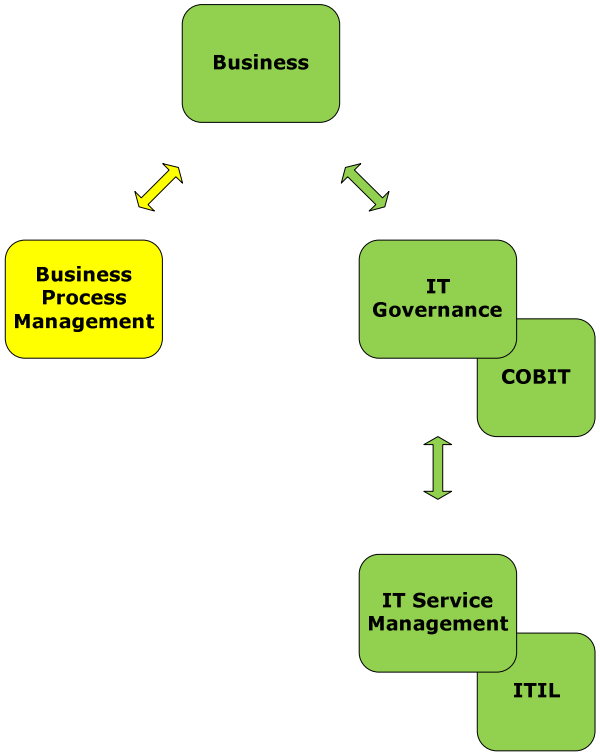

Figure 5 – Level of knowledge for the thesis.

At the same time, BPM was an area to study, but since the objective was to deliver information from SLM to BPM was not imperative to know as well BPM area. In these bases, only SLM had a profound investigation. This chapter is described the most important information gather to create de proposal.

2.2. State of the art

There are several aspects that need to be in consideration in an approach to IT Service Level Management.

2.2.1. Definition

SLM is the process of setting, measuring, and ensuring the maintenance of service goals.

Whatever the service, SLM helps enterprises make sure that the key targets for service success—such as performance, quality, or number of transactions—are being met. SLM defines the metrics for measuring service success, a means for monitoring those metrics, and a process for responding when the metrics are not being met or are at risk of not being met[13].

SLM is a concept often associated with complex IT operations, but it can be applied to any business or service. Some years ago, Domino's Pizza created one of the most recognizable examples of SLM when it promised to deliver each pizza in less than 30 minutes—or give it to the customer free of charge. This simple promise defined all the key elements of SLM by:

- Defining the service (delivery of a customer-selected pizza)
- Providing metrics for measuring the service (30 minutes from phone call to delivery)
- Making a guarantee of performance (100% delivery within the established parameters)
- Specifying a penalty/incentive if the defined service level was not met (free pizza)

Enterprise IT organizations are increasingly being called upon to define and deliver the same sorts of guarantees. To ensure end-user satisfaction, or to meet overall cost and efficiency goals, an enterprise IT team must define the services it intends to deliver, metrics for measuring their success, a means for monitoring and ensuring service performance, and a method of responding if service levels are not met[14].

2.2.2. Terminology

Service Level Management (SLM)

Service level management (SLM) is a set of tools and disciplined, proactive procedures used to ensure that adequate levels of service are delivered to users in accordance with business priorities and at acceptable cost. IT needs to define parameters, establish a baseline, set objectives, monitor and assess objectives, and refine and improve service levels.

Clear and open communication between customer and service provider is essential for effective SLM. The service provider, whether internal to the enterprise or an external third party, must understand what the customer perceives as good service. In tandem, the customer must understand what is reasonable to expect of IT, given limitations in hardware, staffing, and other resources[15].

Service Level Agreements (SLAs)

Service Level Agreements (SLAs) are an agreement between the customer and the service provider. An SLA usually contains:

- A statement of intent
- A description of the service
- The approval process for changes to the agreement
- A definition of terms
- Identification of the primary service users
- Service metrics, which are defined in service level objectives (SLOs) and indicators (SLIs) – Figure 6.

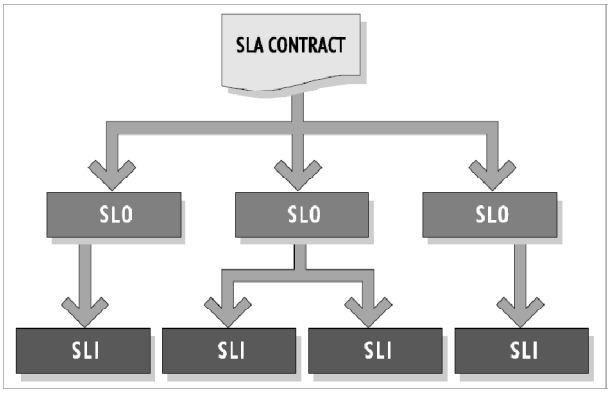

Figure 6 – The SLA Contract (source: [15]).

There are two basic types of SLAs:

- In-house SLA - an agreement negotiated between an IT department and an in-house user group or business unit.
- External SLA - an agreement between a company that is purchasing IT services and an external provider, like a carrier or any one of the many kinds of service providers.

By involving business users in active negotiations about service levels and what it takes to achieve them, IT can educate business as to the true cost of providing any given level of service. SLAs should be revisited periodically to refresh everyone's memory. If service levels erode, IT can point to changes in these circumstances as clear reasons why, and both parties can go back to the table to renegotiate the agreement [15].

Service Level Objectives (SLOs)

Service Level Objectives (SLO) defines the level of service that is to be provided, as agreed to by the parties involved. An SLA covering a service typically contains several SLOs. SLOs are articulated in the context of business goals and contain one or more Service Level Indicators (SLIs).

Some of the more common SLOs include:

- Availability
- Performance
- Mean Time to Repair (MTTR)
- Accuracy
- End-User Response Time

In addition, higher-level, business-oriented SLOs (i.e. transactions completed or number of orders pending) are increasingly more common in today's SLAs.

SLO definition can be a complex exercise. If an SLA is going to be valuable, it must have good SLOs, which should:

- Identify what aspects of service are covered by the SLA
- Relate to specific business objectives
- Identify indicator(s) for each aspect of service
- Define the target level for each aspect of service

While there is no right number of SLOs in an SLA, planners should aim for between 5 and 10, with the goal of keeping SLOs simple[15].

Service Level Guarantees

The distinction between SLOs and service level guarantees is slight. Both represent the level of service that the parties in the SLA have agreed will be delivered. The key difference is that SLOs determine what is being measured, and Service Level Guarantees define the outcome if services should fail [15].

Service Level Indicators (SLIs)

Service Level Indicators (SLIs) are at the heart of any SLA. They allow SLM to be measured and quantified, and provide the "yes/no" assessment of whether or not a commitment is being met. Each aspect or objective (SLO) of the SLA, such as availability, will have a target level to achieve. But the SLA might include multiple SLI for each SLO. Typical SLIs are a percentage of time available or level of performance for a single aspect of a single type of technology.

Ideally, SLIs should:

- Allow quality to be quantified
- Reflect users' pain points and priorities
- Include availability, performance, and accuracy metrics
- Take into account security features and systems
- Be realistic and affordable

The best way to measure service levels is from the user's perspective. How available were the services that users need to do their jobs and how responsive were the services? Whichever way these user perceptions are measured, the SLA will need to document each SLI used to measure the SLOs, and to specify the data source for each.

For example, a Web-based application may define the user response time as the key SLI. It may be the case that the response time is to be measured from the time the "submit" button is pressed to the time a refreshed screen showing confirmation is received. In this case, the user perception is translated into a performance metric that must be measured by an underlying technology, such as a synthetic transaction, where a transaction is created to mimic user behavior for the purpose of measuring results at a given point in time [15].

Availability and Performance Metrics

Performance and availability metrics are essential for SLAs since they provide necessary metrics for measurement.

Availability is usually a simple thing to measure—was the service available when it was supposed to be or not? If it was available, but did not perform properly, then that is a performance problem, not an availability problem. In addition, look at the availability from the perspective of the user, not the service provider. In the SLA, do not include separate metrics for the network, servers, and applications. Rather, represent availability by such things as total hours of availability, hours or minutes of outage, or mean time to repair.

Performance is significantly more difficult to measure than availability. The trick is deciding which aspect of performance is appropriate for the SLA that you are writing and maintaining the end-user perspective—that is, what the SLA is about. And, as with availability, keep it simple—only go as deep as is necessary to accurately reflect the user experience.

When discussing performance for an SLA, the critical question is whether the service functioned as well as it was supposed to. Usually, performance has a speed dimension to it. Speed may be represented by response time, data transfer rate, or other measures. Another common performance characteristic is volume. Volume may be reflected in the amount of data transferred, the number of transactions processed, and so forth.

Unfortunately, as the size and complexity of the infrastructure for providing a service increases, so does the challenge of assessing the availability and performance of service.

Therefore, inevitably, even moderately large or complex environments dictate the use of tools to assist with the data capture. It is important to remember that tools will not tell you which metrics to use. In fact, before you begin to consider purchasing additional tools, you need to know what data you need to capture. Otherwise, you run a high risk of wasting money on tools that fail to satisfy your needs, and end up being little more than shelf ware [15].

Service Level Reporting

Service level reporting should provide a mechanism for contrasting actual results with SLAs and distributing that information to all relevant constituencies.

The output from SLM tools serves two major purposes:

1. Service level reporting demonstrates the value of IT services, and is a way to promote the quality of service provided by the internal or external service provider;
2. Real-time reporting also creates a way to proactively address service difficulties and reduce the negative impact of a service outage or degradation.

Periodic reporting is still very common for meeting the first purpose; however, a recent study by EMA[15] found a high demand for ad-hoc reporting in SLM. Real-time reporting, or continuously updated dashboards and scorecards, is used by operations so they can monitor services being provided.

The format and detail of service level reports will vary according to the intended audience. For example, executive management reports should be highly summarized and outline the performance experienced by the users of the service and reports to individuals with line-of-business responsibilities should relate service levels to business transaction volumes, personnel productivity, and, when possible, customer satisfaction.

2.2.3. Roles and Responsibilities

EMA [15] research shows that enterprises have targeted three core constituencies with their SLM initiatives:

- Business units
- End users
- The IT organization

In addition to these three stakeholders, we can add the external service provider, who clearly also needs SLM to excel.

Business units need SLM to measure the performance and effectiveness of IT-based services. Many companies use SLM to benchmark quality of service or to measure end-user

satisfaction, and business units recognize that effective IT services can make the difference between keeping and losing a customer. IT-oriented metrics also can help measure the efficiency of a business process or service, making it easier to prioritize the steps needed to streamline the business.

End users need SLM in order to gain a better understanding of the IT-based services they receive, particularly from the perspectives of reliability and performance. Enterprise IT organizations often use SLM to set and manage internal end-user expectations. SLM is highly effective in reducing the number of calls made by end users to complain that a service "seems slow" or "isn't working right." Measuring the end-user experience is even more critical when IT services are exposed directly to external customers. SLM is essential for ensuring customer satisfaction, efficient supplier/trading partner relationships, and overall end-user productivity.

IT organizations need SLM in order to prove their value to the enterprise— service level goals, reached in accordance with business and end-user objectives, provide the means to measure IT's performance. In an environment where IT budgets and expenditures on equipment or personnel are being questioned at every turn, SLM data provides a quantitative, reliable benchmark for measuring the value of IT services and the cost of those services. SLM metrics can help the IT organization build a return on investment (ROI) case for new expenditures. Perhaps just as importantly, SLM data can help quantify IT performance in a way that keeps IT focused on identifying and managing the most cost-effective ways to meet service requirements.

Service provider companies have a great need to set up, deliver, manage, and report on services for their customers. This is the "bread and butter" of these companies, and requires additional capabilities, such as penalty calculation, SLA contract tracking, differentiable service levels, and customizable reporting by customer. Service providers that cannot manage the service they deliver to customers, or provide high levels of service, will be overtaken by those who can. SLM provides for both better cost control and can contribute to revenue generation capabilities—an unbeatable combination in the current business environment [14].

2.2.4. Implementation

The core constituencies for SLM (business units, end users, and the IT organization) share a common goal: deliver the service at a level that is affordable and that will provide value to business. In the end of the day, that is what SLM and its enabling technologies are about—business value [15].

In this section, we provide a high-level overview of the five steps that are absolutely essential to a successful SLM program (consult Figure 7):

- Step 1: Define parameters

- Step 2: Establish a baseline
- Step 3: Set objectives
- Step 4: Monitor and assess objectives
- Step 5: Continuously refine and improve service levels

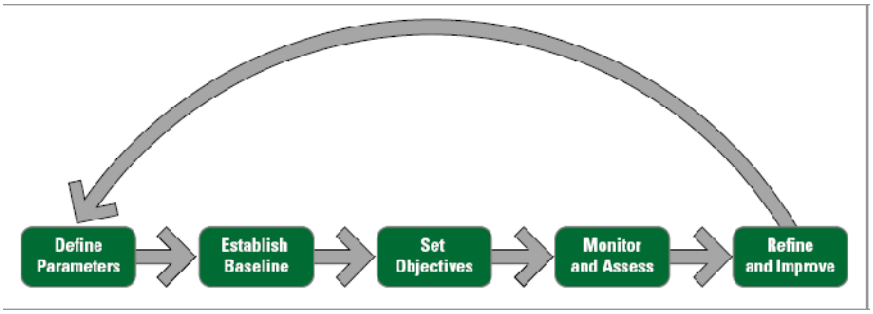

Figure 7 – Five essential steps to a successful SLM program (source:[15]).

Step 1: Define Parameters

The first step in any SLM initiative is to determine which services must be managed. This may be a complex process, because the organization must define a particular service, as well as the components associated with it, and identify critical business objectives. These objectives are then evaluated in terms of the metrics that are available or can be captured, providing an indication of the level of service that can be provided.

Step 2: Establish a Baseline

The next step is to establish a set of baseline data for the purpose of evaluating existing service levels. This should include the data that was identified in the definition phase as representative of the level of service. Data also should be captured that will allow system and network experts to determine what would need to be done to improve the service.

Once captured, the data needs to be analyzed in order to understand:

- The current capabilities of the infrastructure
- Opportunities for improvement in service delivery

With these two pieces of information (current service level and potential for improvement), management is now in a position to talk seriously with internal and external clients about capabilities for service levels. Management has a solid understanding of what is currently being delivered, what improvements can be made, and the cost of those improvements.

Without this information, it is not possible to confidently negotiate SLAs.

Step 3: Set Objectives

Negotiating SLAs is normally the best way to go about setting SLOs. Through the SLA process, the objectives are set jointly. The result should be something that is realistic, attainable, and meaningful to the client. The targets that are set also must be affordable. While service providers can pass along the cost for infrastructure investments to their clients, enterprises must evaluate the affordability of an infrastructure investment in terms of the priority and importance to the business itself.

Internal business users must understand the costs involved in delivering a certain service level. The use of charge-back for the cost of IT services is growing, making IT into a profit center instead of a cost center. This also helps allocate IT's limited resources. If this approach is not used, then executive management will need to be involved to determine the overall priorities of the organization, and allocate IT resources accordingly.

The development of an SLA spans the six phase life cycle of a service shown in Figure 8. When the Customer-Provider interactions address each of these phases, the resultant expectations will be aligned[16].

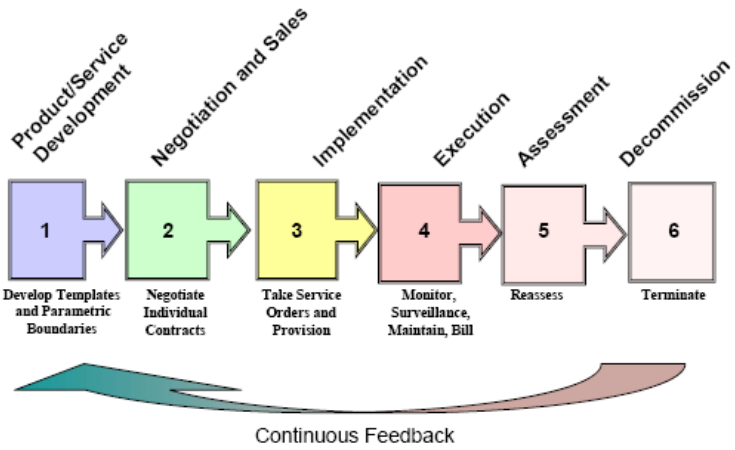

Figure 8 – Service and Associated SLA Life Cycle (source: [16]).

IT outsourcing practices have recently proliferated an interest in service level agreement (SLA) negotiation relevant to engagements with either in-house or external IS service providers. An important research gap exists in establishing Negotiation Support System (NSS) requirements for the processes associated with SLA development. A first step in specifying such requirements is to examine relevant theoretical bases to identify and postulate reasonable propositions.

A second step is to examine the efficacy of the theory-based propositions using the constructs adapted in the context of a relevant, practical and exploratory scenario [17].

Step 4: Monitor and Assess Objectives

Once the objectives have been established, the service provider must take steps to ensure that the SLOs are met. This is an ongoing process of monitoring the level of service being delivered and comparing it to the SLO. While existing management tools may be sufficient, in practice, many organizations find that the monitoring and reporting part of the SLM process is improved (or made possible) with the addition of some specialized tools aimed at that function. Real-time monitoring and alerting allows for proactive measures to ensure SLAs are met.

Regarding network-based IT Services, agent technology is used to automate Monitorization processes. With the aid of training scenarios and experiences from current processes, the agent should learn its behavior to optimize its work-flow. This ability would go far beyond working along predefined formats. It could increase performance and add the characteristic ``intelligence'' to the agents[18].

The Balanced Scorecard (BSC) is the most widely adopted performance management methodology. It is a concept to plan, execute and monitor business strategies. BSC uses a mix of financial and nonfinancial indicators for performance measurement and management. The Balanced Scorecard is designed to transfer strategy into objectives and consider the four perspectives: financial, internal processes, customer and learning [19]. This is used to projecting IT Service Management into IT Governance.

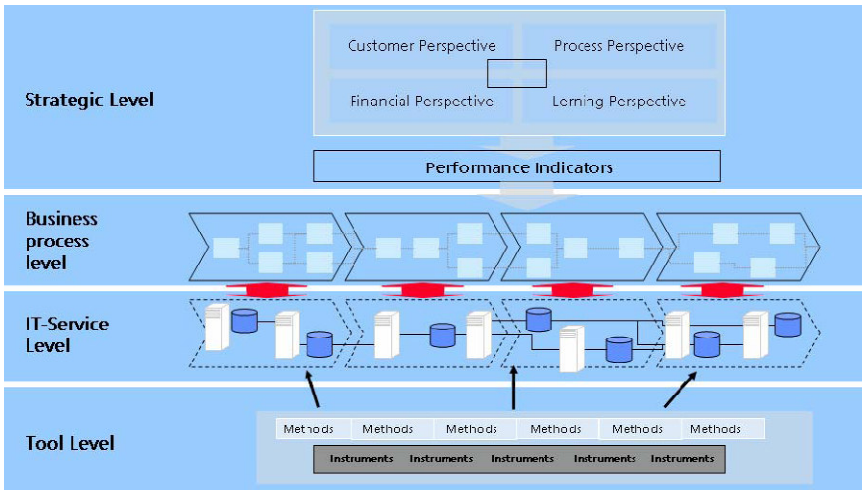

Figure 9 - IT-service performance management framework (source:[20]).

At the technological level, there are several companies that have developed systems that permit, monitor the service “health” like IBM Tivoli or Cisco IP SLA’s [15].

Step 5: Refine and Improve Service Levels

A service provider (whether an IT organization, carrier, or xSP) should never be satisfied with any given level of service, even if that level completely satisfies its obligations to its clients. For competitive reasons, an effort aimed at continuous improvement of the level of service

being delivered is in order. It also may be seen as a way to add more value to the service and, ultimately, derive more revenue.

Furthermore, SLAs will need to be renegotiated as volume grows. Growth will also lead to improvements in the infrastructure and the ability to raise service levels. New services will be created, and SLM will expand into other areas of the business and other areas of the infrastructure. Services may be outsourced, or brought in-house.

Finally, the unstated sixth step of the SLM process is “Repeat.” The process must be regularly scrutinized for relevance, accuracy, etc. The manager or executive responsible for providing the service covered by the SLM process must always be examining both the process and the service, looking for ways to improve both.

2.2.5. Costs and Benefits

What value can SLM bring to the enterprise? This is a critical question, not only because it justifies the decision to invest in SLM, but also because it asks enterprises to evaluate the effectiveness of SLM technologies and processes after they have been deployed. A truly effective SLM initiative will not only deliver a quick return on investment (ROI) on the initial technology and resource investment, but will continue to produce cost savings, improved productivity, and greater customer satisfaction throughout its lifetime [2].

When weighing the value of SLM to your organization, it is important to consider:

- The direct and indirect costs
- The tangible and intangible benefits
- The real and perceived risks

In general, the costs of SLM can be broken into two categories:

- IT costs
- Business unit/user costs

IT Costs

While an effective SLM initiative will involve both IT and business groups, it is IT that generally bears the brunt of the resource costs associated with SLM implementation. It is IT that will be called upon not only to help establish and maintain service levels, but to provide the instrumentation required to measure and monitor them.

There are several categories of direct IT costs in SLM:

- **Time and personnel**. For IT, the chief cost of implementing SLM is time. The processes of defining a service, base lining the service's performance, establishing SLOs and SLAs, and monitoring and tuning service levels can be resource-intensive.
- **Software**. No matter what the SLOs or service level metrics, any IT-based service level agreement will require some method of base lining, measuring, and monitoring service reliability and performance. The "sticker price" of additional tools and technologies, as well as the cost of maintaining them, must be factored in the SLM value equation.
- **Hardware**. In some cases, the aforementioned SLM applications and agents will require the addition of servers or workstations to operate them. Instrumenting services for SLM often requires a hardware investment. Again, a list price is usually sufficient to account for these costs.
- **Administrative costs**. Aside from the time and personnel required to execute the initiative itself, SLM often entails related administrative costs, such as SLM training for IT personnel, time spent to justify or "make the case" for an SLM initiative, evaluation/procurement time for new products, and so forth.
- **Maintenance and repair**. If SLAs are violated or general thresholds exceeded, IT must initiate an effort to find the source of the problem and perform the required tuning or repairs to get the service back into compliance. The cost of this effort, while difficult to estimate, should be factored into the equation.

Business Unit/User Costs

For any SLM effort to be successful, it requires participation by those who have a stake in the performance of the service. This will generally include representatives from the business units that deliver the service and, in some cases, users or customers of the service as well.

SLM initiatives typically require a manpower investment for several key functions:

- **Service definition**. In some cases, the SLM initiative will prompt the first joint meetings of all the contributors to a given business service. The process of defining the service, identifying its component parts and processes, and establishing its target user base can be time-and resource-intensive.
- **Setting service objectives**. Once the service has been defined, some participants must provide input on the means of measuring its success. After broad performance goals have been set, participants may give guidance that helps IT set the proper metrics for measuring service performance, and may even participate in the testing of SLM tools and processes.
- **Ongoing service monitoring**. Most SLM initiatives require monitoring not only by IT, but also by the business units involved in service delivery. Whether the business

staff plays a primary or secondary role in monitoring, there is a business personnel cost associated with the SLM monitoring function.

While SLM costs are relatively easy to quantify in dollars or hours, its benefits are more difficult to place a value upon. There is usually general agreement that improved service levels will increase user productivity, lower IT costs, or improve customer satisfaction, but it is often hard to quantify SLM's potential impact on these areas [13].

In general, the benefits of SLM can be broken into three categories:

- Direct IT benefits
- Direct business unit/user benefits
- Indirect benefits that may be felt by both IT and business groups

Direct IT Benefits

For the IT organization, SLM provides an opportunity to carve out a group of systems, services, and people, and to establish them as a single "service" that can be benchmarked and monitored separately from the rest of the IT infrastructure. Not only does this make the service easier to measure and monitor, but it also helps IT establish processes and tools for building and maintaining the service components.

Among the direct benefits of SLM for the IT organization are:

- **Improved planning**. Once a service has been identified and goals set, the IT organization no longer has to guess what tools, equipment, or services might be required to support it in the future. This leads to more intelligent decisions on personnel deployment, equipment/software procurement, and services contracting.
- **Improved instrumentation**. The implementation of SLM often enables IT organizations to justify investment in tools and practices that provide essential data about infrastructure and applications. This data, which often extends beyond the specific service to shed light on the entire IT infrastructure, helps to optimize operations and prevent problems before they occur.
- **Improved diagnostics**. The implementation of SLM often provides the opportunity for IT to purchase and/or integrate new tools and practices for event management, with the goal of finding and diagnosing problems in interconnected components that each contribute to a single service. These technologies and practices often help in improving diagnostics and maintenance practices across the IT infrastructure.
- **Improved use of staff resources**. As a result of the above three benefits, IT organizations often find that IT operations personnel who were previously devoted to planning, monitoring, and/or diagnostics have reduced their workload and may now be available for other duties. Outside the IT operations center, many

enterprises also see a drop-off in calls to the IT service desk, because SLM creates more realistic end-user expectations and helps eliminate nebulous complaints about service performance.

Direct Benefits

Since the primary goals of SLM are to improve business services and increase user productivity (and/or customer satisfaction), the direct benefits to business units and end users, should be readily evident in any SLM implementation.

Among the key areas of benefit to watch for are:

- **Improved service availability**. A key goal of most SLM efforts is to ensure that the service is available when users need it. An improvement in availability—typically easily measured by checking successful logon attempts or completed transactions—generally translates to improved end-user productivity, greater customer satisfaction, and/or a better overall impression of service quality.
- **Improved service performance**. Although there are many different definitions of service performance and quality, an effective SLM effort generally will refine those definitions to focus on the most critical metrics, and then find ways to improve upon them. Some of these metrics, such as end-user response time, may be relatively easy to measure. Others, such as quality of end-user experience or customer satisfaction, may be more subjective.
- **Improved end-user satisfaction**. Whether the service is internal or customer-facing, SLM generally helps define end-user needs and expectations more concretely, so that they can be met more consistently. The result of any SLM effort should be happier users of the service. However, this level of satisfaction may be difficult to measure, because end users' evaluations of a service are subjective and dynamic.

Indirect Benefits

Another way to view the value of an SLM initiative is to measure the benefits of SLM against the costs of not implementing it. In other words, if SLM eliminates one service failure per month, or 100 abandoned electronic shopping carts, how does that problem avoidance translate into cost or revenue savings? These are difficult benefits to quantify, because in each case, the enterprise is attempting to identify the cost of an event that might have otherwise happened, but was avoided. However, these considerations are important in assessing the overall value of SLM.

Some examples of the indirect benefits of SLM include:

- **Downtime avoided**. In many cases, SLM will help IT to recognize potential service problems before they occur, perform diagnostics, and/or fix problems before they result in service failure. If there is a historical record of service failures, the organization can benchmark the frequency of failure before SLM against the frequency of failure after SLM, and use the delta to show the benefit of the SLM initiative.
- **Business improvement**. In some cases, such as online retailing, the effects of IT service improvements on the success of the business may be readily measured. However, in many other cases, IT service quality may be only one of many components that affect business success. If a company makes product improvements simultaneously with IT service improvements, which of those improvements should get the credit for increased sales? Like many other business initiatives, SLM's impact on overall business performance may be positive, yet difficult to isolate.
- **Productivity gained**. If service performance and/or reliability are improved, then it stands to reason that end users will become more productive. However, the impact of improved IT service on a specific user's productivity may be difficult to measure. One way to estimate this metric is to simply count the number of users affected and the number of hours/minutes gained, and then multiply this by the average end user's salary/benefit figure.

2.2.6. Problems

Despite the many valid benefits of SLM, there are still a number of barriers that cause organizations to hesitate on implementing an SLM program[2], including:

- **Economic issues** – A reluctance to allocate budget for new management software and perhaps hardware and personnel to support it.
- **Technical issues** – A common misperception that SLM solutions are difficult to implement, and create even more of a burden once installed.
- **Cultural issues** – Political tension created by the fact that SLM demands a connection between business goals and IT.

In addition to these barriers, there is a considerable amount of fear, uncertainty, and doubt surrounding SLM. Some managers may fear SLM because they have already had painful experiences with service level agreements. Instead of treating the SLA as a means of communication and collaboration, customers or clients have used it as a club to attack the IT manager or service provider.

The IT group may also have committed to SLAs that were unreasonable because they lacked a good understanding of what service could actually be provided, given the current

infrastructure. There are also managers who are uncertain as to where they should begin—they do not know how to go about establishing and managing a program for SLM or how to negotiate SLAs. In addition, some managers may doubt the wisdom of spending money on SLM, or that SLM can provide significant benefits.

Although there is much evidence about the role and importance of SLAs in the context of Service Management, SLAs show many shortcomings in practice. From empirical research major problems have been identified[8]:

- **Specification of effort versus specification of results** - Most SLAs focus on agreements regarding the effort that will be spent by an SIS provider in case a problem occurs. However, no commitments are specified regarding the effectiveness of a service for a customer's business processes and business objectives. Instead of "services regarding system X will support your company with reaching business objectives Y ," an SLA usually states "we will be at the problem location within a certain amount of time in case system X breaks down."
- **Unclear service specifications** - Agreements on for instance "the availability of a network" are usually specified using a metric called the availability percentage. It is often hard to determine what the precise meaning of such a metric is in the context of a specific business location. For instance, what is the difference between an availability percentage of 98% and 99%? And does 98%, on a yearly basis, mean that the network is allowed to go "down" for a whole week, after being "up" for the last 51 weeks?
- **Incomplete service specifications** - It is difficult to make complete agreements on particular services, for instance on services such as security control and disaster prevention. A key problem is that it is often difficult to describe and to quantify the consequences of fraud and disasters and to determine what type of services is needed and to what extent.
- **Insufficient cost management** - Cost management is often expressed as "making agreements on a fixed price each year for an integrated set of SIS services." In what way these costs can be differentiated and can be related to specific SIS services, in conformance with the needs of a customer, is often unclear. As a consequence it is very difficult to determine a price/performance optimum for each particular service for a customer.
- **"Dead-end" SLA documents** - A Service Level Agreement is often a technical document regarding concepts and terminology that can only be understood by a small group of technology oriented specialists. Often, evaluation and improvement does not take place on a regular basis. Such a 'static' or 'dead-end' document has a very restricted meaning for end-users and their management. The latter are not able to interpret the 'agreed' service specifications nor are they able to tune or

enrich the agreed service level agreements. After some time the specification of an SLA tends to become 'just an unsatisfying tradition.'

2.2.7. Frameworks and Best Practices

ITIL

Driven by the U.K. government's Central Computing and Telecommunications Agency, ITIL is a set of definitions or best practices for IT organizations. While it covers other areas, ITIL main focus is service management.

ITIL is based on defining best practice processes for IT Service Management and Support, rather than on defining a broad-based control framework and focuses on the method and defines a more comprehensive set of processes [21].

ITIL views service management as a single discipline with multiple aspects, and advocates taking an integrated approach to implementing service management. ITIL service management is generally divided into two subcategories: service delivery and service support [14].

The disciplines under service delivery are:

- Service level management
- Capacity management
- Contingency planning
- Availability management
- Cost management for IT services

Service support is made up of five disciplines:

- Configuration management
- Problem management
- Change management
- Help desk
- Software control and distribution

In Figure 10 it's possible to see how the users and costumers relate with the different ITIL processes.

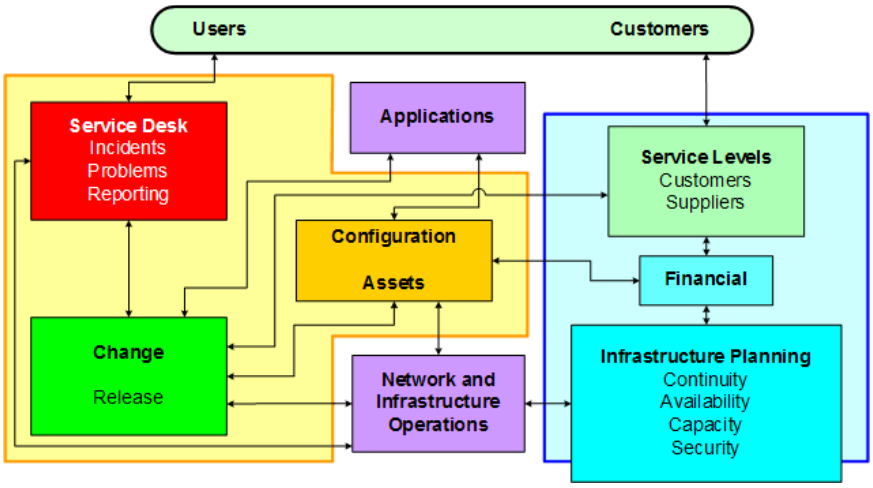

Figure 10 - ITIL Processes (source:[22]).

This approach defines IT quality as the level of alignment between IT services and actual business needs. As a result, organizations can mature their best practices without regard to specific technologies [22].

COBIT

For IT to be successful in delivering against business requirements, management should put an internal control system or framework in place. The COBIT control framework contributes to these needs by [1]:

- Making a link to the business requirements
- Organizing IT activities into a generally accepted process model
- Identifying the major IT resources to be leveraged
- Defining the management control objectives to be considered

The IT Governance Institute has developed a framework for IT Governance and control called “Control Objectives for Information and related Technology” (COBIT).

While addressing the management of IT, it is written for business executives and couched in business terms, such as key performance indicators (KPIs), key goal indicators (KGIs), and critical success factors (CSFs). The framework contains 34 high-level control objectives, and 318 corresponding detailed objectives. Its focus is to help business management gain IT alignment with business goals and manage risk in IT [23].

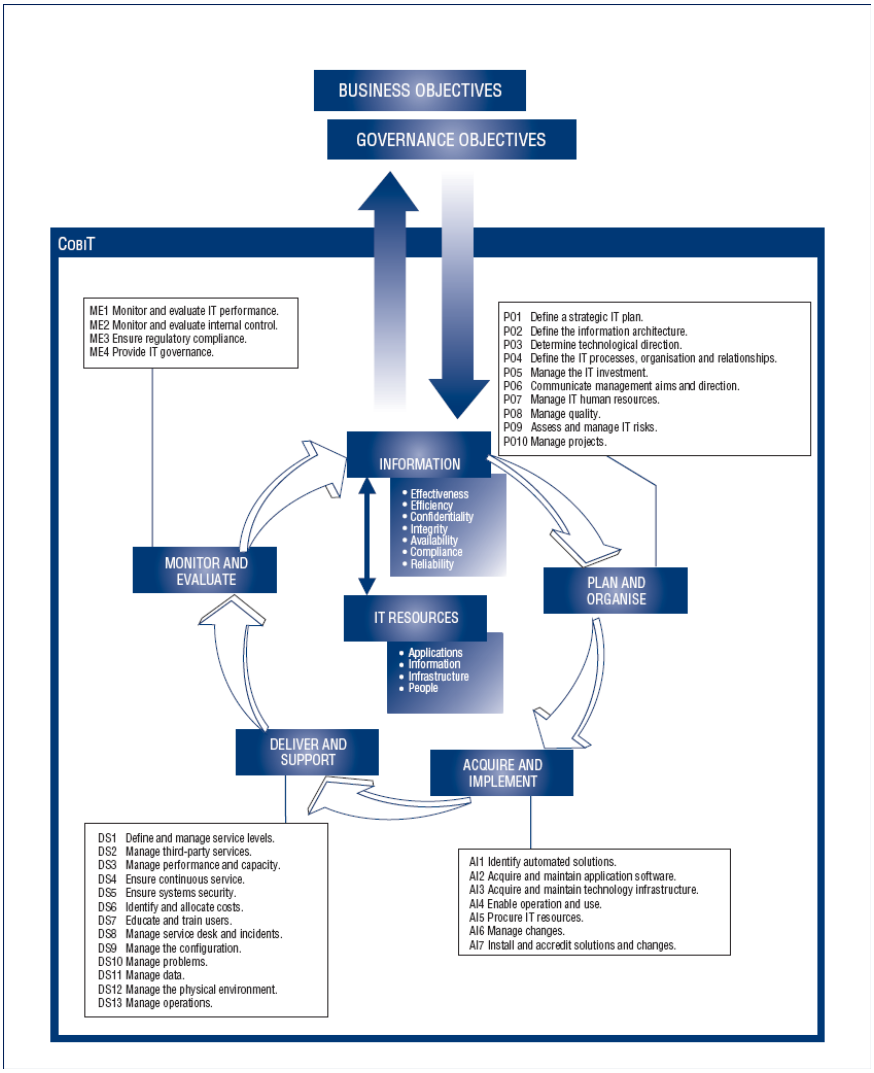

Figure 11 - Overall COBIT Framework (source:[1]).

However, COBIT does not include process steps and tasks because, although it is oriented toward IT processes, it is a control and management framework rather than process framework. COBIT focuses on what an enterprise needs to do, not how it needs to do it, and the target audience is senior business management, senior IT management and auditors [21].

Six Sigma

Six Sigma provides a process of improvement, ways to measure quality and set objectives, as well as mathematical solutions that identify root causes and eliminate defects. The quality management philosophy of Six Sigma can also be extended to SLM. The disciplined Six Sigma approach calls upon practitioners to define, measure, analyze, improve, and control (DMAIC), so it is very well-suited to a business process like SLM [15].

In contrast, applications of Six Sigma that focus on the design or redesign or products and services and their enabling processes so that from the beginning customer needs and expectations are fulfilled are known as Design for Six Sigma (DFSS). The focal aim of DFSS is to create designs that are resource efficient, capable of exceptionally high yields, and are robust to process variations. This aim produces a recasting of DMAIC that can be aptly characterized as Define–Measure–Analyze–Design–Verify and described as follows [24].

- Define customer requirements and goals for the process, product, or service.
- Measure and match performance to customer requirements.
- Analyze and assess the design for the process, product, or service.
- Design and implement the array of new processes required for the new process, product, or service.
- Verify results and maintain performance.

Six Sigma can be integrated with the Balance Scorecard since it has been used by senior executives for more than a decade and represents excellent tool for strategy development [25].

TeleManagement Forum (TMF)

The TeleManagement Forum [15], an industry association composed mostly of carriers and service providers, was formed in order to improve the management and operation of communications services. TMF focuses its efforts on improving the performance of operations support systems (OSS): the operations, administration, management, and provisioning systems of most carriers and service providers. Many of the SLM concepts developed to ensure the quality of telecommunications services are now being applied to enterprise services, so the TMF's activities and specifications are worth watching as they evolve.

3. Problem

3.1. IT Problems and Priorities

Several concepts have been developed during the last few years such as IT governance, IT score-cards, and benchmarking that have been considered by IT and business executives. But surprisingly, a recent study by the IT Governance Institute (ITGI) that covered 335 CEOs and CIOs in 21 countries, reported "while more than 91 percent of executives recognize that information technology (IT) is vital to the success of their businesses, more than two-thirds of CEOs are not comfortable answering questions about governance and control over their IT processes." The study validates that the major problem continues to be "the in-adequate view of how well IT is performing" [26]. Figure 12 illustrates this analysis.

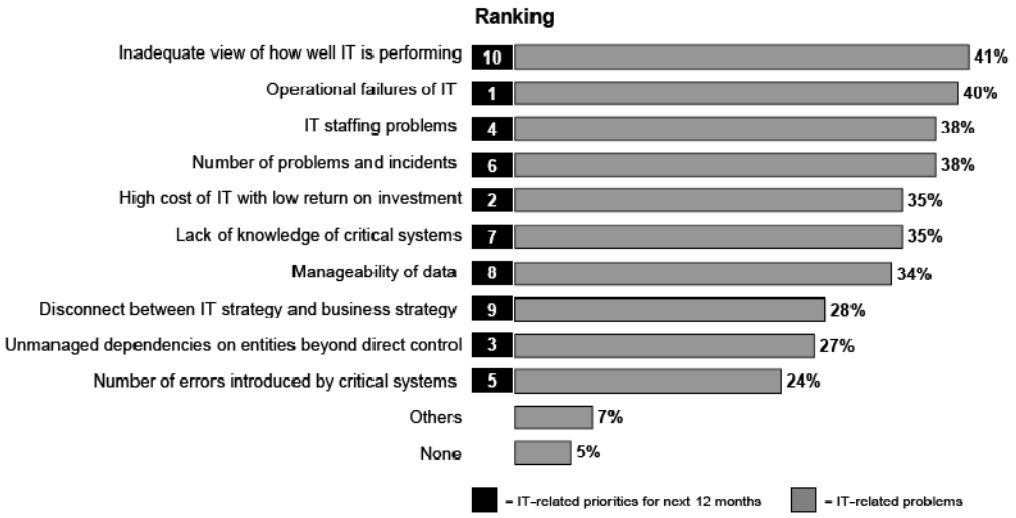

Figure 12 – Problems and Priorities of CEO's and CIO's (source: [27]).

It's imperative for the success of Companies now and in the future, to have a better control of the IT and IS. This control it's only possible if IT were manageable. To conquest this goal, it's necessary to measure.

3.2. Legal Obligations

It's a fact that the IT needs to be aligned with business and not the other way around. Business can be represented as a Value Chain that organizes the business horizontally, dividing in areas from providers, throw transformation into customers. Figure 13 illustrates the Porter's Value Chain in a Strategic Management point of view.

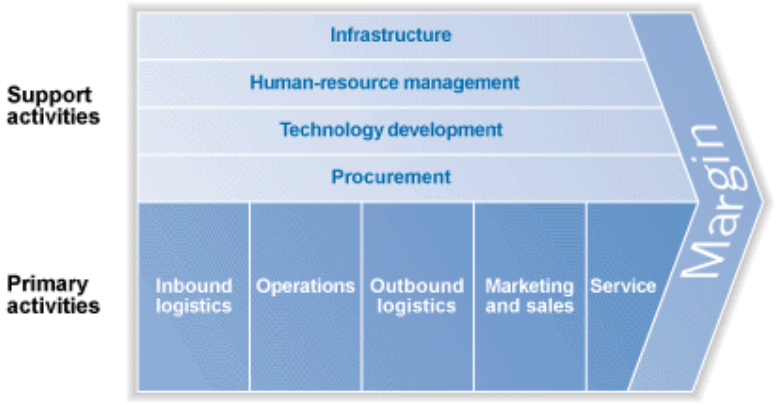

Figure 13 – Porter's Value Chain (source:[28]).

Companies of all sizes are wrestling with the issue of IT compliance. From government mandates such as the Sarbanes-Oxley Act of 2002, Basileia II, etc., to meeting quality guidelines such as COBIT (control objectives for information and related technology) and ITIL (IT infrastructure library), organizations are learning to adapt their software development process so that it becomes a true business process that can be tracked, measured, repeated, and cost controlled. Even small private organizations that are not driven by government mandates are striving to reach IT compliance standards as they relate to cutting IT costs by eliminating ad hoc and no repeatable activities, improving software quality through metrics and measurements, and reining in the risk associated with releasing software applications to a production environment.

The trend toward IT compliance is really a way for upper management to say that software development must be managed in the same way as other departments, standardized, and repeatable. IT compliance really means that delivering business software solutions is no longer seen as a mystical activity performed by a few really technical people, but instead is viewed as a business process that must be carefully monitored, audited, and controlled to maximize the overall benefits of business automation [29].

Within governmental bodies there is a debate about how to proceed with the development of new services required linking online government to its client base across industry and the citizenry. At the heart of the matter is a dispute over contracting, and implicit questions of insourcing, outsourcing and a proper private-public mix of IT solutions [30].

3.3. Business Process Management Needs

Throw time, Managers had the need to create Business Process architecture in order to create a map of the organization processes and goals. Business process management is a field of knowledge at the intersection between management and information technology, encompassing methods, techniques and tools to design, enact, control, and analyze operational

business processes involving humans, organizations, applications, documents and other sources of information [31].

Business Activity Monitoring (BAM) is software that aids in monitoring of business processes, as those processes are implemented in BPM systems. BAM is an enterprise solution primarily intended to provide a real-time summary of business processes to operations managers and upper management. As such, BAM presents dashboards that contain key performance indicators (KPI) that support root cause analysis and alerts that warn of impending problems. Trouble notification functions are integral to most BAM solutions and these are many and varied. For example, whole groups of people can be sent e-mails, voice or text messages, according to the nature of the problem. Automated problem solving, where feasible, can correct and restart failed processes.IT Strategy is aligned and evolutes from Business Strategy. The relation between Business and IT Governance is supported and has real-time monitoring by Business Service Platform that also contains KPI. At the same time, the alignment between IT Governance and IT Service Management is also well defined. COBIT and ITIL have a primary role in these relations for the companies that implements them. Figure 14 uses an illustration previously used in Chapter 2, to relate each area and the types of systems that support that relation.

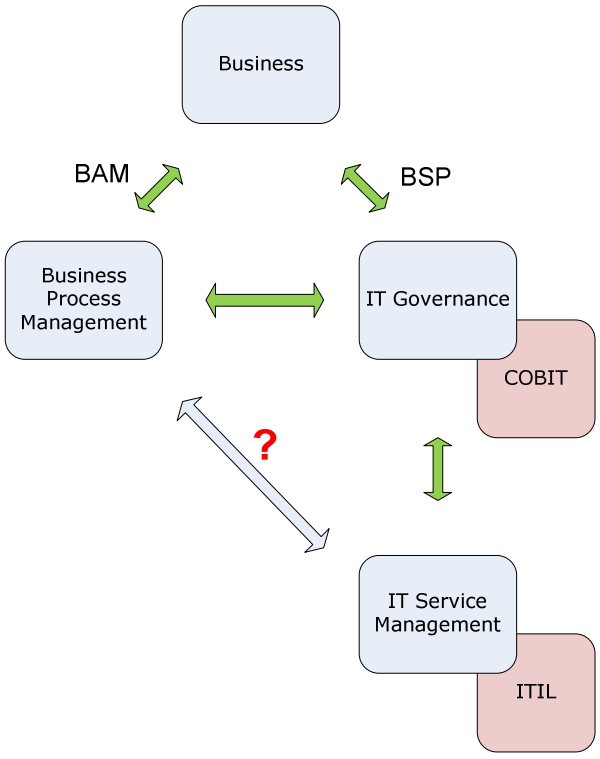

Figure 14 – Relations and the systems that support them.

But since BPM is supported by IT Services, wouldn´t make sense if there was some kind of alignment between them?

3.4. Customer-Provider IT Service Relation

With time and with the need to divide costs throw business units, the relation between internal customers, internal business support and service providers got more complex.

Today, IT services are delivered through a mix of structured and unstructured work activities. Structured activities rely primarily on standardized processes, procedures, and tools. In IT service support and delivery, an increasingly popular standardization effort is embodied by Information Technology Infrastructure Libraries (ITIL) [32] [33], which prescribe processes for capacity management, availability management, service-level management, and financial management to achieve high quality IT services.

Unstructured activities involve local work practices, custom developed tools, ad hoc collaborations with colleagues, and informal procedures. These activities include seeking information from colleagues or external sources, writing custom scripts, troubleshooting, renegotiating policies, seeking approvals, discovering change impacts, and sharing information on demand [34]. Results from the studies of IT service delivery suggest that considerable time is spent on unstructured work activities [35] [36], which are not surprising as knowledge work is typically collaborative, informal, and situated [37].

Customer orientation is one of the most important strategic orientations in the context of strategic IT management in today's enterprises [33]. Enterprises need to manage the delivery of services that support users in conducting their activities in the context of business processes. They have to achieve a common understanding between the customer/user and provider through managing service level expectations and service level delivery, and delivering and supporting desired results [38].

External IT providers as well as internal IT departments are no longer sheer technology providers. Instead, most of them act increasingly as service providers for IT users. These IT users, respectively customers, demand functionality with a defined quality that supports their activities within business processes and improves their productivity [39].

In order to specify IT provider / IT customer coordination, IT services need to be defined. Service and quality characteristics for such IT services are negotiated between service providers and customers and specified by means of a service level agreement (SLA) [40]. Thereby, it makes no difference whether the user receives the service from an internal IT department or from an external service provider. This transformation from a technology oriented IT shop towards a customer oriented service provider that engineers its IT processes in a systematic, methodical manner can only be done in terms of a service oriented IT management [33].

Figure 15 illustrates a customer-provider cycle example.

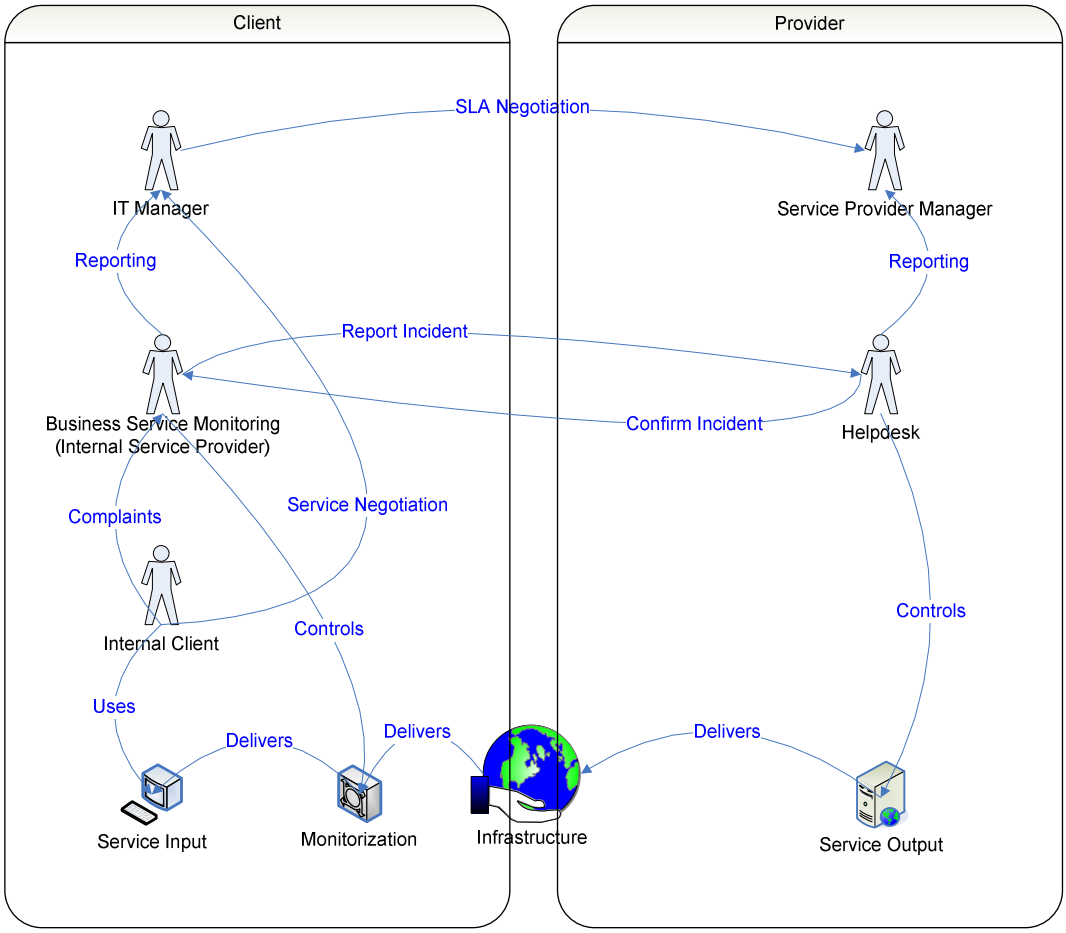

Figure 15 – Customer-Provider cycle.

3.5. IT Investments

Appropriate information technology investments can help companies gain and sustain a competitive advantage [41]. Although they form a subcategory of technology, information technology projects possess unique characteristics. It is significant that many information technology investments have proved unsuccessful, exceeded budget, and even harmed companies [42] [43] [44].

Companies model and optimize their business processes as a means for increasing the (external) value gained from these processes [45]. As the majority of business processes in today's highly automated world are supported by IT systems [46], the success of a business strategy is also linked to the availability of the appropriate IT systems: poor IT investment decisions may entail corporate failure. This is the case if (i) IT systems do not fully support the specific business processes (e.g., using only standard software that lacks the appropriate

adaptations), (ii) the IT systems are inefficient with respect to the firm's strategic objectives, or (iii) the core functions are shared and freely available [47].

Thereby, the decision of the right service has a major importance. How can we better the information delivered for this proposal?

3.6. IT Monitorization

On day to day monitorization BAM systems gather information of the state of each Business Process. At the same time and when a business process is affected by one activities that is suspended because an incident on a service, BAM system only into the Activity or in a good case to the task.

In the same time that this service fails, Business Service Monitoring areas, integrated in ITIL Service Support, focus on resolving that incident and gather information to identify if that incident is a problem.

A plethora of service oriented IT management concepts have been developed in the past. The IT Infrastructure Library (ITIL) is the de-facto-standard for IT service provider and it is probably the most extensive concept for IT Service Management (ITSM) [48]. ITIL can be defined as a generic reference model that supports planning, monitoring and controlling of IT services [33]. Its most important components are "Service Delivery", "Application Management", "Service Support" and "ICT Infrastructure Management" [48]. Concepts for the provision of IT services can be found in "Service Support" and "Service Delivery", especially within the process definition for service level management (SLM).

The performance optimization tools used to accurately gauge performance, as with all the software tools used by the organization, have to be in the organization's CMDB (Configuration Management Database). Configuration management is the implementation of a database that contains details of the organization's elements that are used in the provision and management of its IT services. This also is known as an asset register. Now, that we have the tool, the basis of usage is guided by the SLA. The application should comply with the service level agreements (SLA) before it passes out of the hands of the performance analysis team. An SLA is framed and finalized after discussions with the intended client, and it shall contain the kind of results expected in specific terms and the level of severity [49].

3.7. Conclusion

IT drives to the goal of acting as a service provider to the rest of the business. However, responsible IT Service owners are challenged by the fact they often don't have a clear perspective of the business health of critical processes that their IT systems are supporting. And although service owners need business-significant metrics to really understand business health, most event data from infrastructure management tools is IT-centric, and has little relation to relevant business conditions.

At the same time, business operations teams are trying to use information provided by IT to help them understand how their key business processes and services are performing. When an IT problem is reported, business personnel need to verify that they have the information required to understand the implications of the problem on key business processes and customers, and ultimately on the business itself. By enabling IT to gain visibility and a better understanding of the condition of business services and processes that are key to the business, IT Service managers and service owners will have a better business perspective and the right level of knowledge to respond to, and negotiate with the business [50].

4. Proposal

4.1. Introduction

The introduction to the proposal begins with the conclusion of the problem in Chapter 3. After the analysis, some facts can be stated as needs or problems which probably an IT System solution could help.

In order to help to focus and organize, 4 points were defined as the back bone of this proposal:

- **Types of companies aimed**: Governments, big companies with or without a large percentage of IT Outsourcing and Service Providers.
- **Legal Obligations:** Sarbanes-Oxley and Basel II.
- **Management needs:** IT and Business Strategy's alignment; SLA's implementation in a customer-oriented process; IT measurement and payoff; choose the right Service;
- **Best practices used in IT:** COBIT, ITIL and BPM

Resuming, there's a needed of a Business Process-oriented IT Services Monitorization, which permits a better measurement of IT Services performance and costs in order to respond to the Legal Obligations and Management needs, interacting directly with the Business Processes.

After the study of the areas related with this work, and particularly the Service Level Management, the proposal that help aligned the monitorization of IT Services on a Business Process perspective was clearly.

Probably the best way to espouse this idea is in the form of a Framework, which is used in research to outline possible courses of action or to present a preferred approach to an idea. To create this Framework I propose 6 steps:

1. Framework;
2. Pre-requirements;
3. Implementation;
4. Monitorization;
5. Evaluation;

During this Chapter I'll try to explain the proposal in a way to aggregate Management needs with IT Service monitorization.

4.2. Framework

First it's needed a Conceptual Model that helps understand and organize the ideas. Based on Enterprise organization of areas and the relations between them, a cycle is created.

COBIT, ITIL and BPM helps throw this cycle illustrated in Figure 16 that goes from Business Requirements which defines goals that are represented in Business Process throw BPM. This Business Processes have Activities that need IT Support that delivers Services which provides Information, creating Competitive Advantages responding to initial Business Requirements.

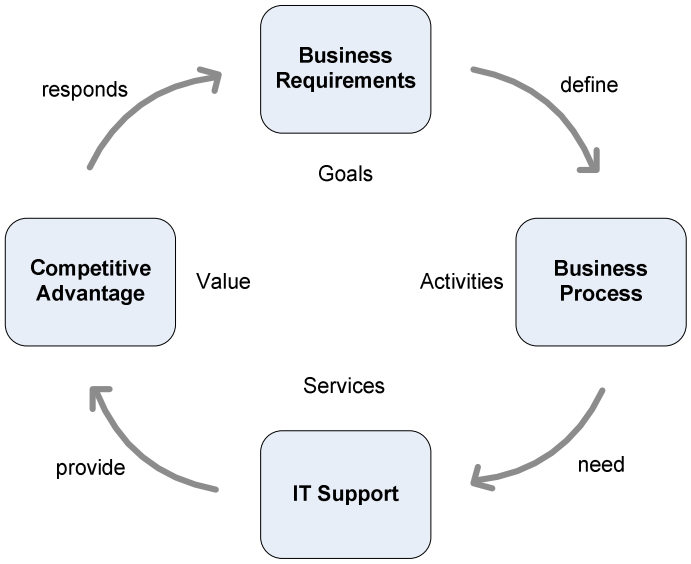

Figure 16 – Cycle supported by COBIT, ITIL and BPM.

This cycle creates in each area Key Performance Indicators that helps managing those areas independently and at the same time aligned with the goals define by Business Strategy. This cycle defines the 3 pillar Business Process-oriented IT Service Monitorization Framework, depicted in Figure 17. The main objective is not during the Implementation but in the Monitorization of performance and costs.

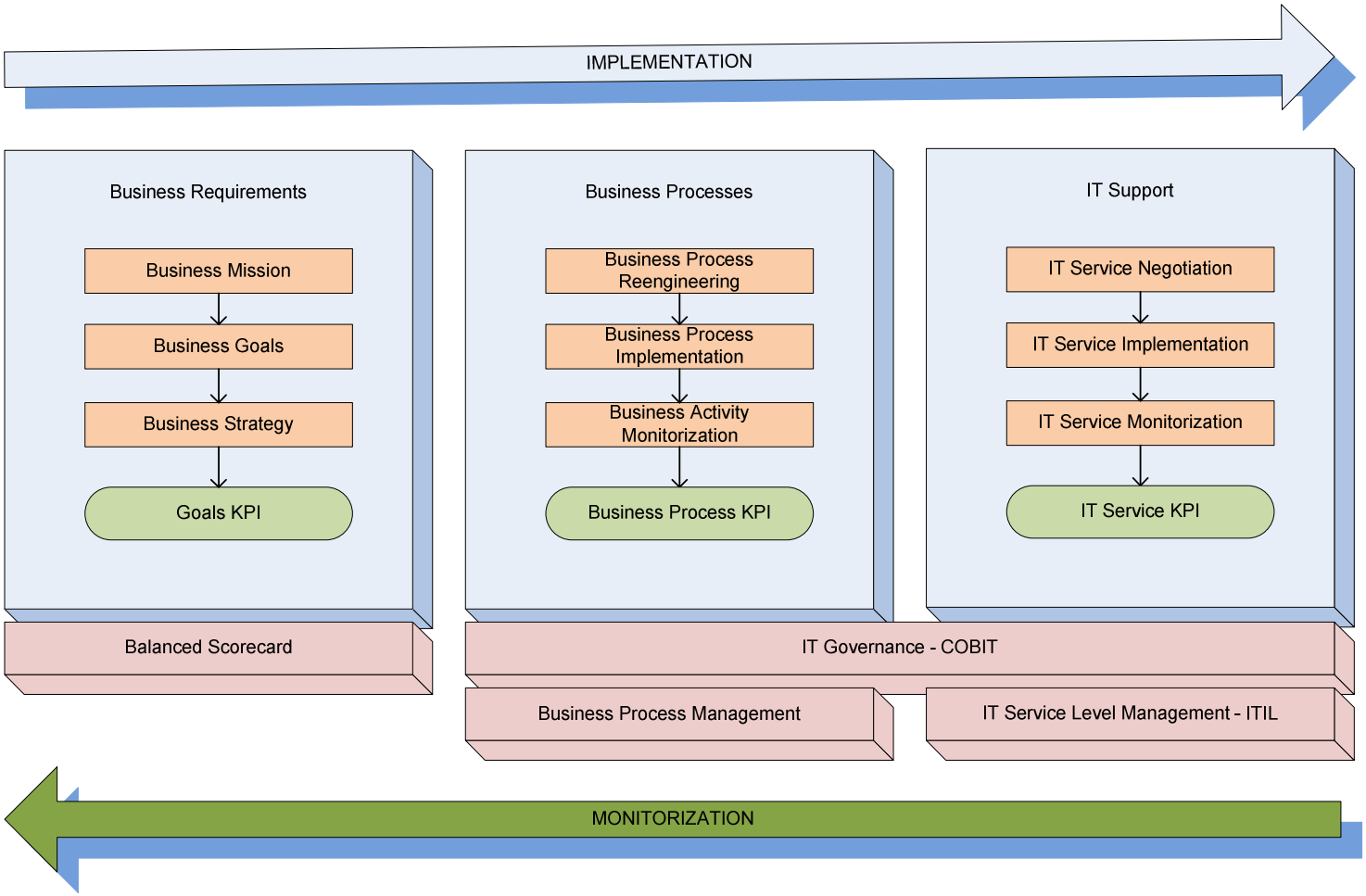

Figure 17 – Conceptual Overview.

The Relation between Customers and Providers and the SLA is one of the problems. It's very hard to define costs on a Service since IT doesn't know how the costs can be divided between customers.

At the same time, IT Service doesn't know which services are costing more to the business in that specific time when several are stopped. Enough information and systems are available to manage IT Service Support as to manage Business Process Management. The problem is in the monitorization and in the evaluation on relation between IT Services and Business Processes.

4.3. Pre-requirements

For greater success on the implementation of the proposal, some pre-requirements are expected. These requirements are essential and the better are the know-how and state of maturity of the requirements, greater are the success factor. Such as:

- A IT Governance Framework such as COBIT to a better BPM and ITIL integration and Management;
- A Business Process Management must have well defined and normalized Business Processes which represent the strategic goals and needs;
- A IT Service Management Framework such as ITIL to good IT Service Delivery and Support and a CMDB that support them;
- KPI's must be Specific, Measurable, Achievable, Relevant and Timely;
- A Balanced Scorecard which:
    - Translates the vision into operational goals;
    - Communicates the vision and link it to individual performance;
    - Business planning;
    - Feedback and learning and adjusting the strategy accordingly;

Normally, the CIO has these competences and has the better comprehension of these requirements. It's essential that Managers have Dashboards that permit interact, configure and manage information of the KPI's and the Monitorization. An IT Governance and IT Service Management mature. A CMDB which permits centralized and organized information of information systems.

4.4. Implementation

For the implementation independently of the physical architecture used by companies, it's needed that the Logical architecture respects the relations as depicted in Figure 18.

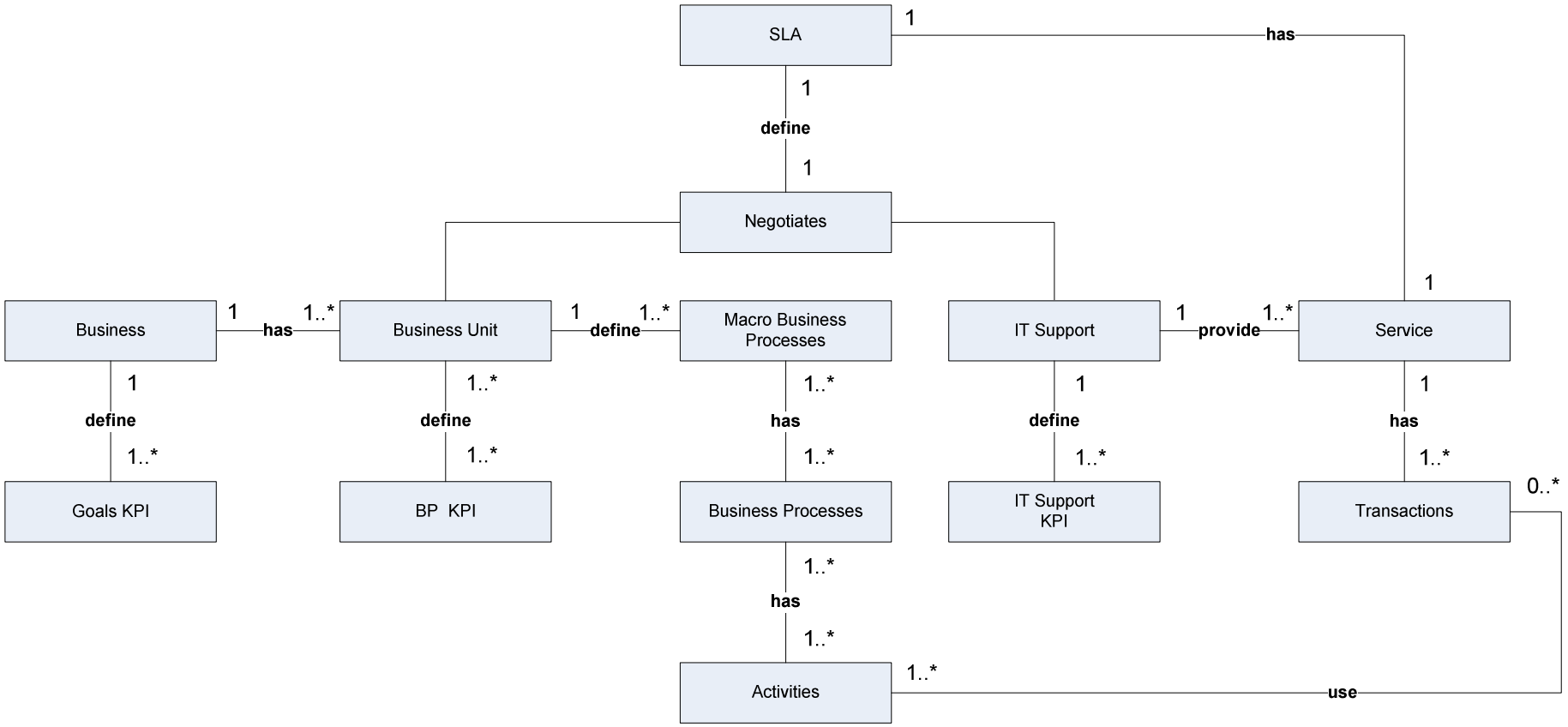

Figure 18 – Logical relation of the Framework.

SLA will permit to divide costs and evaluates the performance of each service as a singularity. In the other hand, KPI's will permit no measure performance of each area and relation between them will permit an impact analysis from IT Service to Business Goals.

Each entity can have particularities of the business in hands, but in this relation are several points to be attention:

1. SLA Definition;
2. KPI Definition;
3. Business Process – Activity – Transaction – Service Relation;

SLA Negotiation and Definition

SLA must have three types of information: (i) Service, (ii) Business Unit and (iii) the relation between Transaction and Activity.

(i) In the Service Information must be defined:

- Total Cost = Base Cost x Availability;
- Hierarchy of Service Transactions;

(ii) In the Business Unit

- Activities and the related Business Process that will use this Service;

(iii) Activity x Transaction Relation;

- Which Activity uses which Transaction;

This information is essential to cost division and performance measurement proposed on Evaluation step.

KPI Definition

The KPI's should have a hierarchy. A Goal KPI can be affected by 1 or more Business Process KPI, and at the same time a IT Service KPI can affect 1 or more Business Processes.

This relation will permit to measure performance in a Business Process-oriented way, proposed on Evaluation step.

Business Process – Activity – Transaction – Service Relation

This relation will permit a macro view of the relation between all Services and Business Process in order to have an exact measurement of an IT Service impact. The finer the granularity we have, the more will be the Evaluation precision.

An IT Service is a group of Transactions. These Transactions realize actions that are atomic i.e. Home Page, Log In, Create Product, Edit Collaborator etc. These Transactions could also have a hierarchy, i.e. to Create Product we need to access the Home Page. Transactions can also have the Function designation where for a group of variables returns a result. In Information Systems can also be seen as buttons, commands, web services etc. Also, Transactions and/or IT Services can be grouped in an Application or Web Page. This is not important. What matters is the IT Service as a whole and not it's organized. Transactions are also important because it's what is used by the Activities.

Also, it's not important to know what kind of software, hardware or infrastructure is used for an IT Service. For a Customer-oriented view it's only important what they can see or use. IT Support must have the resources to guarantee this proposal.

As illustrated in Figure 19 is the relation between Business Process – Activity – Transaction – IT Services that is the base of this proposal. We have 2 possible scenarios: (1) when two or more IT Service affects one Activity and (2) when two or more Activities are affected by one IT Service.

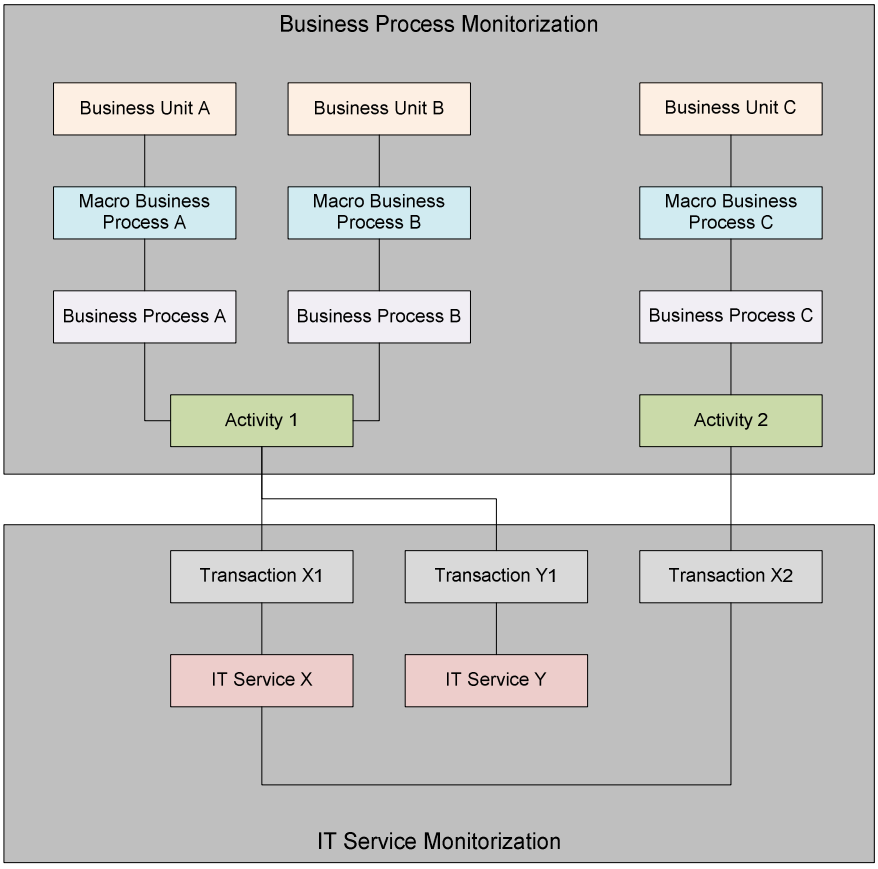

Figure 19 – Business Process Monitorization and IT Service Monitorization relation.

Scenario 1 – If IT Service X and Y fail, Activity 1 and 2 are affected. But if Transaction X1 fails and X2 doesn't, only Activity 1 is affected. In the Performance context Business Process A and Business Process B are affected. Table 1 shows the relation of Scenario 1.

Scenario 1		Business Impact	
		Activity 1	Activity 2
ITS X	Trans. X1		
	Trans. X2		
ITS Y	Trans. Y1		

Table 1 – Scenario 1: IT Service and Activities relation.

However, if Transaction X2 heredities from Transaction X1 (ex: Transaction X1 as Home Page and Transaction X2 as Log in, it's possible if the Home is "down" it's not possible to make a Log in), when Transaction X1 fails, also Activity 2 is affected. In this case Business C is also affected.

Scenario 2 – If IT Service X fails, Activity 1 and 2 are affected. But if only Transaction X2 fail, only Activity 2 is affected. In the Performance context only Business Process C is affected. Table 2 shows the relation of Scenario 2.

Scenario 2		Business Impact	
		Activity 1	Activity 2
ITS X	Trans. X1		
	Trans. X2		
ITS Y	Trans. Y1		

Table 2 – Scenario 2: IT Service and Activities relation.

This is why it's necessary to have Transactions. It's the base that relates Activities and IT Services.

It's also important the hierarchy of the Activities. That also possible that Activity 2 it's only be realized if Activity 1 is finished. BPM have to deliver this hierarchy.

4.5. Monitorization

A real-time monitorization expects that IT Support deliver not just to the Service that is stopped but also the transaction of that Service. The BAM monitorization will not change, because the granularity of this kind of tools goes only to Activities. Operational managers doest

need to know that is the transaction that have failed, only the Business Process and Activities, so that he can make the necessary arrangements so that the business where less affected as possible.

On the IT Support point of view, normally it's not necessary which transaction fails, because that is a concern of IT Provider. Only maters the time-to-repair is respected, other SLA requirements and IT Services KPIs. But when there's a need to divide costs and measure performance, this relation will permit to be accurate.

On a Dashboard, the information necessary for who manages Business Process, is the Business Process affected by an Activity that cannot be executed, caused by a system failure. Since Business Process are "persons" which executes tasks, managers can re-organize and re-plan the work of the collaborators that maybe are stopped to. Each business has their own characteristics and needs, and it's not an objective to identify all benefits, only to explain the possibilities of this monitorization.

4.6. Evaluation

On the Customers mind, are several questions that are a concern that this proposal could help. Such as:

- Am I paying the right price for this IT Service?
- Do I have the right IT Service?

Regardless the formula used to divide the cost of an IT Service for the Business Units that is used, it's not important if the IT Services KPI's where acceptable but if the expectations of the Business Units were satisfied.

When an SLA is negotiated without background history of the Service performance it's very difficult to know the right price to pay. But with time, information can be gathered and analyzed, with the goal of measure how the performance of business process where affected by the IT Services that Support them.

Table 3 shows an example where IT Service X accomplished SLA requirements on Availability and Time-to-Repair but where the business measure was affected in 10%. I.e. this 10% could be a product that could not be delivered on time because of IT Service failure.

Both BP A and BP C uses IT Service X, but only BP A is affected by the IT Service X regardless if it accomplished SLA contract.

		Business Impact		SLA Impact	
		BP A	BP C	Avail.	TTR
ITS X	Trans. X1	90%	100%	100%	100%
	Trans. X2		100%	100%	100%
ITS Y	Trans. Y1	100%	100%	75%	80%

Table 3 – Business and SLA impact.

This helps to analyze if we are paying the right price for the IT Service and/or comprehend if the IT Service is the right for that Business Process.

At the same time, Business is satisfied with IT Service Y but regardless the business satisfaction, SLA was not accomplished. Maybe it's possible to renegotiate the SLA lowering the indicators and as well the price of the IT Service, without penalize the Business performance.

This view also brings new points to have in consideration when IT Services KPI's are defined. They have to relate with Business Processes KPIs in order to align with business goals.

In both cases, business wins!

5. Case Study

Note: In this Chapter there can be some information appearing as XXXX or not explicit. This mark will appear for all information marked as confidential by Millennium bcp.

5.1. Introduction

The Case Study based on this proposal was made in Millennium bcp, the biggest Portuguese bank. Millennium bcp has an IT Global Division that is responsible for the IT in the bank. IT Global Division is organized as depicted in Figure 20.

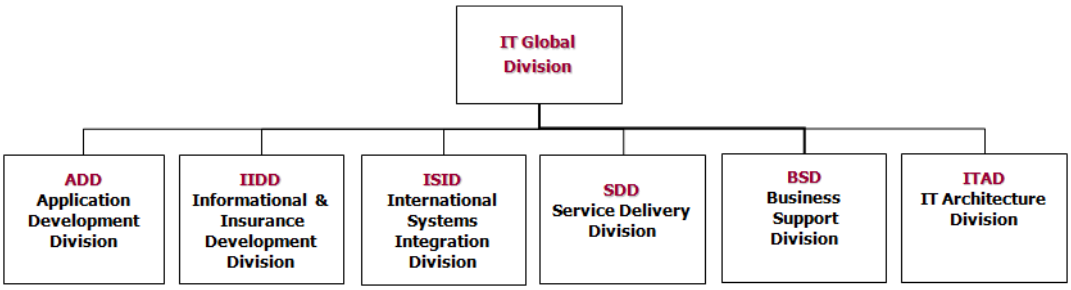

Figure 20 – Millennium bcp IT Global Division.

Business Support Division is responsible in part for the IT Service Management. This Division has other sub-divisions as illustrated Figure 21. Business Service Monitoring is responsible for the Negotiation, Client Support (as a Helpdesk 1st line) and Problem and Incident Management.

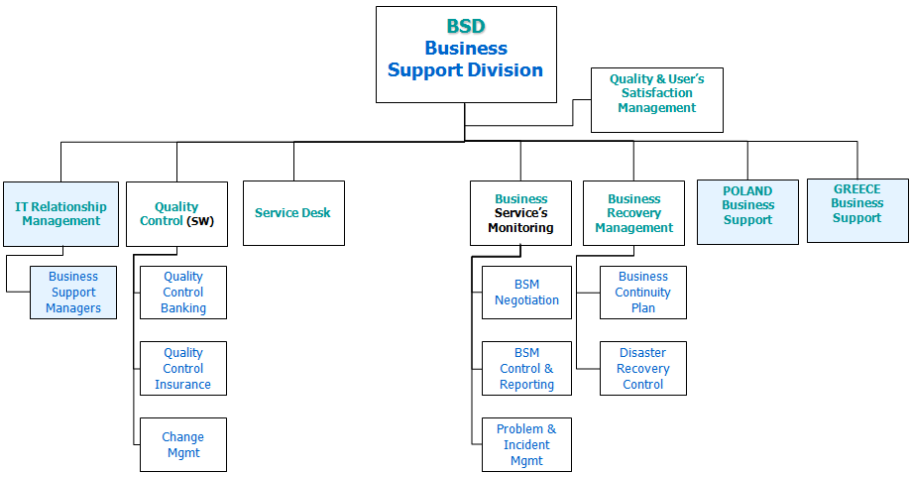

Figure 21 – Millennium bcp Business Support Division.

BSM is the area that is responsible for IT Services information delivering and managing the information needed for this proposal. Basileia II come as a legal obligation and in the IT concern, was a need to define the Business Process for the risk and capital analysis. Each Business Unit is responsible to deliver those Business Processes. After the Business Processes pass on Quality Division, they are ready to use.

The goal of the project was unique: to prove if this approach brings value to Millennium bcp. This work was made by direct supervision of BSD and BSM Direction.

It's also relevant to inform that Millennium bcp has part of the IT supported by an outsourcing agreement with IBM. The Group continues to be responsible for the management of IT Service Management [51].

5.2. Project

The project was based on the proposal and two kinds of information where required: (i) Business Process that already passed quality and (ii) IT Services information.

There was delivered 80 Business Processes and 413 IT Services. For the purpose of this work, it was necessary to filter this information for a smaller number of data. Thus, Dr. Joaquim Calhau, Director of Business Service Monitoring, gave the information that from the 413, 76 were considered "critical" for business. From those 76, 20 are referred as the ITGD 20, the most important indicator for Business Service Monitoring.

After gathering information of those 20 IT Services, was made a cross-reference with the information from the Business Processes delivered. From this relation, 21 Business Processes where identified as the primary users of the IT Services defined earlier as the ITGD 20 from Business Service Monitoring.

Nevertheless, some information was not available. There was no indication of the Transactions used by the Activities in the Business Processes, only the name of the applications used by the users. This is perfectly normal, since the Business Processes where made by Business Units and customers/users don't have the information beyond the applications used. On the time available for this project few information where delivered by application management.

Thus, five Business Processes and five IT Services where used on this trial. The relations between them are depicted on Table 4.

Business Process	Activity	IT Service	Transactions												
Account Opening	Activity A	n/a													
	Activity B	ITS 1	ITS 1 T1	ITS 1 T2	ITS 1 T3	ITS 1 T4									
		ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity C	ITS 1	ITS 1 T1	ITS 1 T2	ITS 1 T3	ITS 1 T4									
		ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity D	n/a													
	Activity E	ITS 1	ITS 1 T1	ITS 1 T2	ITS 1 T3	ITS 1 T4									
		ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity F	n/a													
	Activity G	n/a													
Credit Cards	Activity A	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 3	ITS 3 T1	ITS 3 T2	ITS 3 T3	ITS 3 T4	ITS 3 T5	ITS 3 T6	ITS 3 T7	ITS 3 T8	ITS 3 T9				
		ITS 4	ITS 4 T1	ITS 4 T2	ITS 4 T3	ITS 4 T4	ITS 4 T5	ITS 4 T6	ITS 4 T7	ITS 4 T8	ITS 4 T9	ITS 4 T10	ITS 4 T11	ITS 4 T12	
	Activity B	ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity C	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity D	n/a													
	Activity E	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity F	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 3	ITS 3 T1	ITS 3 T2	ITS 3 T3	ITS 3 T4	ITS 3 T5	ITS 3 T6	ITS 3 T7	ITS 3 T8	ITS 3 T9				
		ITS 4	ITS 4 T1	ITS 4 T2	ITS 4 T3	ITS 4 T4	ITS 4 T5	ITS 4 T6	ITS 4 T7	ITS 4 T8	ITS 4 T9	ITS 4 T10	ITS 4 T11	ITS 4 T12	
	Activity G	ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
		ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 3	ITS 3 T1	ITS 3 T2	ITS 3 T3	ITS 3 T4	ITS 3 T5	ITS 3 T6	ITS 3 T7	ITS 3 T8	ITS 3 T9				
		ITS 4	ITS 4 T1	ITS 4 T2	ITS 4 T3	ITS 4 T4	ITS 4 T5	ITS 4 T6	ITS 4 T7	ITS 4 T8	ITS 4 T9	ITS 4 T10	ITS 4 T11	ITS 4 T12	
	Activity H	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
House Loan	Activity A	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity B	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity C	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity D	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity E	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity F	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity G	n/a													
	Activity H	n/a													
	Activity I	n/a													
	Activity J	n/a													
	Activity K	n/a													
	Activity L	n/a													
Personal Loan	Activity A	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 3	ITS 3 T1	ITS 3 T2	ITS 3 T3	ITS 3 T4	ITS 3 T5	ITS 3 T6	ITS 3 T7	ITS 3 T8	ITS 3 T9				
		ITS 4	ITS 4 T1	ITS 4 T2	ITS 4 T3	ITS 4 T4	ITS 4 T5	ITS 4 T6	ITS 4 T7	ITS 4 T8	ITS 4 T9	ITS 4 T10	ITS 4 T11	ITS 4 T12	
	Activity B	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 3	ITS 3 T1	ITS 3 T2	ITS 3 T3	ITS 3 T4	ITS 3 T5	ITS 3 T6	ITS 3 T7	ITS 3 T8	ITS 3 T9				
		ITS 4	ITS 4 T1	ITS 4 T2	ITS 4 T3	ITS 4 T4	ITS 4 T5	ITS 4 T6	ITS 4 T7	ITS 4 T8	ITS 4 T9	ITS 4 T10	ITS 4 T11	ITS 4 T12	
	Activity C	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity D	ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity E	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity F	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity G	n/a													
	Activity H	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity I	n/a													
Loan Recoverable	Activity A	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
		ITS 5	ITS 5 T1	ITS 5 T2	ITS 5 T3	ITS 5 T4									
	Activity B	ITS 2	ITS 2 T1	ITS 2 T2	ITS 2 T3	ITS 2 T4	ITS 2 T5	ITS 2 T6	ITS 2 T7	ITS 2 T8	ITS 2 T9	ITS 2 T10	ITS 2 T11		
	Activity C	n/a													
	Activity D	n/a													
	Activity E	n/a													

Table 4 – Relation between Millennium bcp Business Processes and IT Services.

Each Business Process has Activities and for each Activity is related with the IT Service used. Sometimes an Activity might have more than one IT Service, and for each IT Service is the Transactions that compose the IT Service. There are some Activities that are not support by any of this IT Service, but could have other that it's not consider for this trial. In gray are the Transactions used in each Activity.

It was not possible to make an Activity or Transaction hierarchy. The Business Processes have a logical sequence in the models but it was not possible to identify if one or more Activities where impossible to do, if the Business Process stops. At the same time, Negotiation area of Business Service Monitoring also doesn't have the Transactions hierarchy.

5.2.1. Application

After gathering all the information needed, was developed an Information System to manage and analyze the information delivered by this proposal. This IS was developed in C# using Visual Studio 2005 and SQL Server 2005 already used by Millennium bcp.

Next Figures will show the product developed and some explanations will be made. For this part, only two Business Processes are displayed. Figure 22 shows the Business Processes Overview where it's possible to observe that "Account Opening" has no Incidents opened and "Activity A" of the "Loan Recoverable" is affected by one or more Incidents.

In this Overview its possible no view all the Processes that are being monitored and each Activity of the Process. It's also possible to view the state of each Activity: when an Activity is "Red" indicates that one or more transaction that supports the Activity it has an incident; when "Green" all transactions are ok; when "Grey" it means that the Activity is not supported by any service.

With this view it's possible to view and consult every Process and every Activities of that Process, and at the same time, know what Process and which Activity are stopped because of a technological service.

This relationship possibility to broadcast an alert to the Business Process owner and every worker that interacts with that process, offering information of state of the Process and at the same time, pass information of the Activity that it's not possible to do. At this time, managers and works have the possibility to rearrange the operational organization and not waste time with a non-working service.

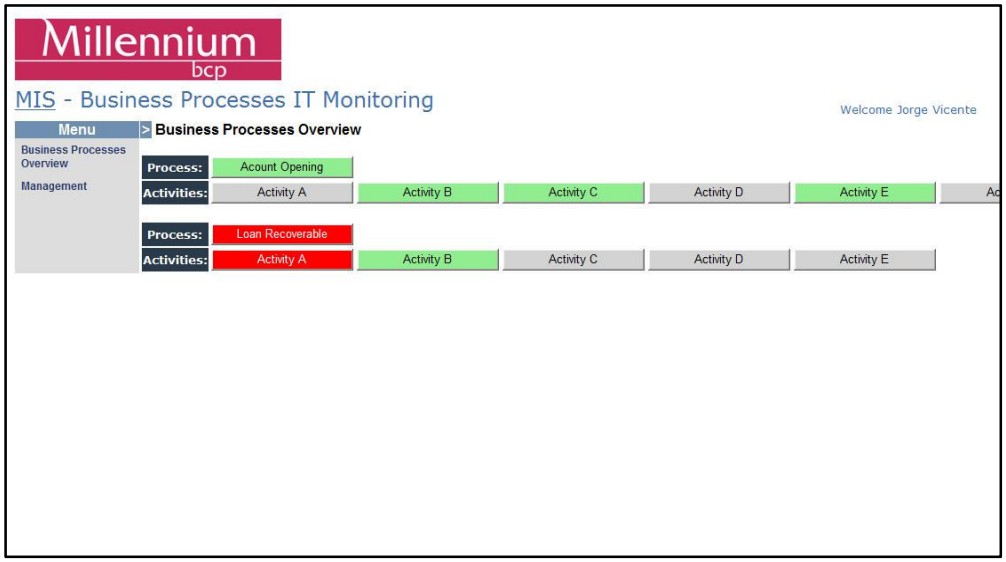

Figure 22 – Screenshot 1 MIS: Business Process Overview.

In Figure 23 is depicted the Business Process Management interface that will appear when a Business Process is choose. Its possible no consult or change the Business Process information. It's also possible to create new Activities that are added to the existent Business Process.

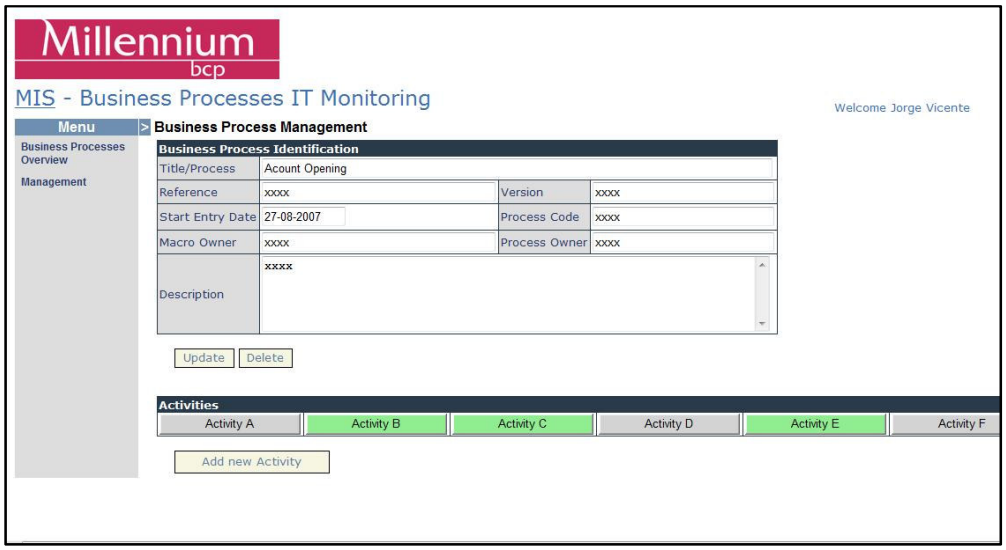

Figure 23 – Screenshot 2 MIS: Business Process Management.

If "Activity B" is clicked, will appear the "Activity Management" window, which permits to consult and change the IT Service and the Transaction that compose them. In this case there is no Incident opened in this Activity, as illustrated in Figure 24.

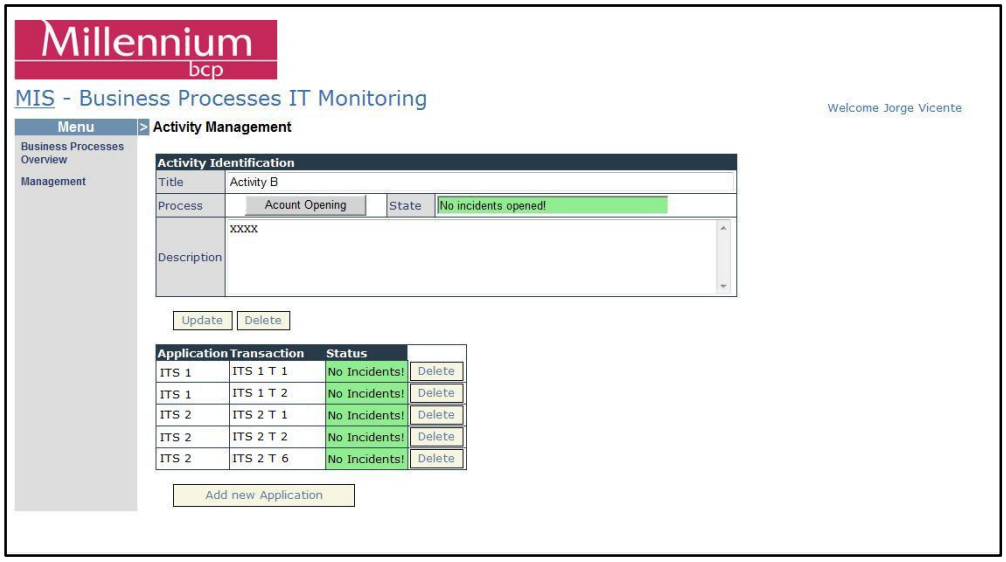

Figure 24 – Screenshot 3 MIS: Activity Management.

But in the case of the "Loan Recoverable" it's an Incident opened. It's also possible to see which IT Service and respective Transaction is causing the Incident as depicted in Figure 25.

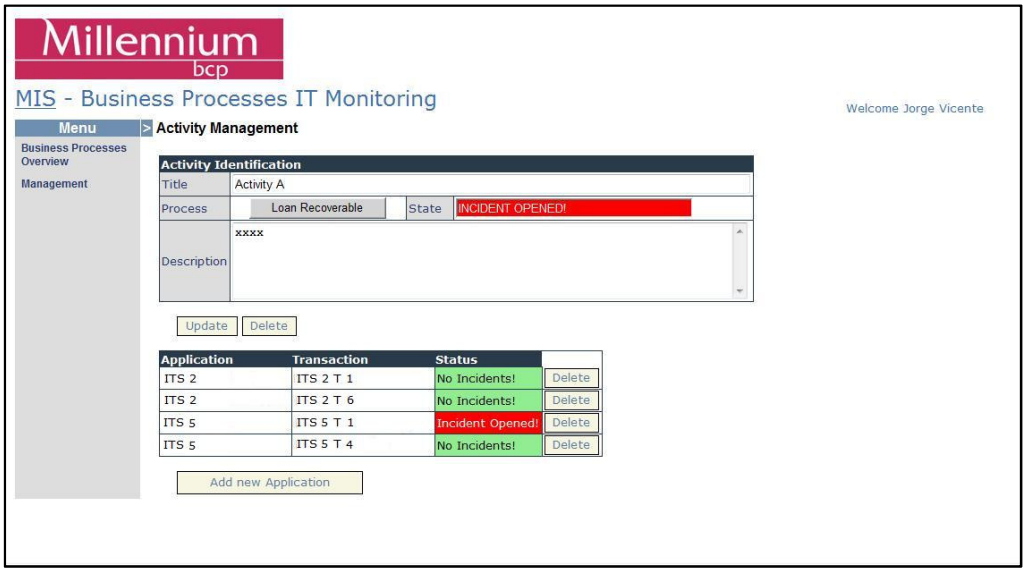

Figure 25 – Screenshot 4 MIS: Activity Management.

Both figure 24 and 25 shows the Activity information and the relation of the Services with that Activity. Service monitorization delivers information that permits to relate the Activities with the Services relating a Transaction with the Activity. At the same time, the sort of the information from a Transaction permits to know what are the total Activities affected by an isolate incident.

5.3. Conclusion

Although the application were intended to help Business Support Division to measure the impact of IT Services incidents and problems to the business, this application was requested by Operation Managers from the branches as well. The fact of knowing in real-time what activities are affected by the IT Service incident permits to change people coordination to a better branch performance.

Business Process IT Monitoring is now available to Management Information System portal of BSD. These tools already have requests to add functionalities in order to improve and be as customable as possible.

The project was considered a success despite the information available was somehow limited.

5.4. Results and Analysis

Unfortunately it wasn't possible to go further in gathering all the information regarding business processes and IT Services. When I obtain all the information delivered, I observe that the business processes models weren't normalized. At the same time only the applications names were available in the business processes.

It was very hard to get a cross-reference between activities and transitions since each business process had different model and I expend a lot of time normalizing the information. I also made an effort to define activities and transactions hierarchy, but in the time available was not possible. To do this is necessary to interview all the business process owners and define the hierarchy, but when I try to do the first, the business process owner had doubts on this subject.

Also SLA is far for being in mature state and little information about cost and performance was available.

It may seem that BSD and BSM responsible doesn't help, but the truths is that gathering this information and make a cross-reference it's very hard and time consuming. Millennium bcp delivered all the information requested and BSD inclusively pay the bill.

When the application passed production, little time was left available and the results obtained don't get to any conclusion. The only big result was the satisfaction and acceptance of the proposal and the application.

Dr. Nicolau Romão, BSD director and Dr. Joaquim Calhau, BSM director, were very satisfied with the solution and I also get the feedback that this monitorization was a step forward

in the mind shifting, that IT must have on the business impact. BSM team was also sensible to this subject and supported the idea, especially the negotiation team.

The application will be maintained and engineer João Costa is now responsible for the solution.

6. Conclusion

IT drives to the goal of acting as a service provider to the rest of the business. However, responsible IT Service owners are challenged by the fact they often don't have a clear perspective of the business health of critical processes that their IT systems are supporting. And although service owners need business-significant metrics to really understand business health, most event data from infrastructure management tools is IT-centric, and has little relation to relevant business conditions.

At the same time, business operations teams are trying to use information provided by IT to help them understand how their key business processes and services are performing. When an IT problem is reported, business personnel need to verify that they have the information required to understand the implications of the problem on key business processes and customers, and ultimately on the business itself.

By enabling IT to gain visibility and a better understanding of the condition of business services and processes that are the key to the business, IT Service managers and service owners will have a better business perspective and the right level of knowledge to respond to, and negotiate with the business

Regardless the difficulty in getting references for this thesis on the matter of monitorization, the need for this kind of tools is demanding every day. In the study of IT Governance and IT Service Management areas, it was possible to conclude that the future passes throw a precise and sustainable measurement and analysis of business and IT performance.

Business modulates itself as business processes and Business Process Management is the base for a well a consistently measure of business performance. IT is increasing every day in enterprises because the competitiveness in the markets today, and few activities developed by companies aren't supported by any kind of IT Service.

The link between Business Processes and IT Services goes far as the granularity goes, and in form on conclusion, I define the relation between activities and transactions the bound that connects them,

This relation can be used to measure costs and performance. Regardless the form that companies calculates this indicators, it's now possible to create bullet proof SLA reports that are non-repudiation efficient. Providers could in the future be obligated to respond for their performance. At the same time, customers and users could be more satisfied with their IT Services since they will be aware the right price to pay for an IT Service and have tools to demand the right service-level.

I also conclude that companies aren't probably ready to deliver this kind of information. Business Process Management and IT Service Management work separated and for this alignment companies probably need the way they work. Companies are ready to rapidly IS implementation that support the monitorization. The bottle neck will be the creation of information architecture for this kind of solution.

Figure 26 depicts a resume of the framework benefits.

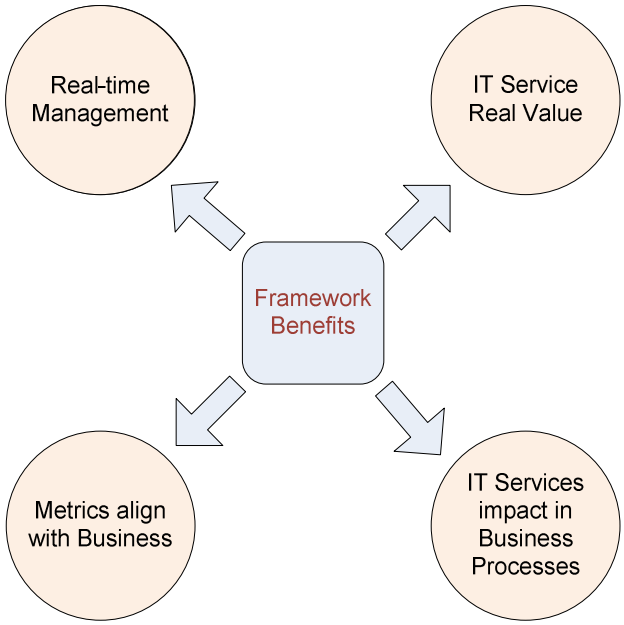

Figure 26 – Framework benefits.

ITIL and COBIT is fundamental to this line of work. The success factor of this proposal passes throw a well managed and governed IT Service area. It's possible that in the long run the results could get confused if the business weren't well aligned with the business. The awareness of an actualize CMDB would also help to support this architecture.

After a great number of information gathered from the monitorization, Data Mining could be the future to try to forecast, business bottle necks and IT Service critical periods. There is also very important the companies where process and customer-oriented. If the results were not toward in this way, it's possible that this is not the best way to analyze this matter.

Though the case study was made in a bank, the results are not only to this line of business. Business processes are organized practically in the same way everywhere. At the same time so does the IT Services. These areas are running to a uniformed architectures and frameworks, and I think this proposal is base of the future ahead.

Based on the results and the fact that the biggest Portuguese Bank sees the importance on this matter, I congratulate myself for this work. Never the need for IT and Business alignment

were stronger and for a sustainable management, it's necessary to monitor and measure performance. SLAs are the base for an effective outsourcing and strong customer-provider relation.

6.1. Future Work

I hope that this thesis would help in defining a better monitorization set of tools with the purpose to align business and IT needs. Millenium bcp could help on this matter, since they already have a very good Business Support Division and probably is the best and better prepared company in Portugal to advance in this area.

Future work for the BSD team: get more and better information in the MIS and start to produce enough information to get provable results.

I think that only enterprises and universities that have very tight relations with these enterprises can improve this line of work. For the universities, I resume some points that can be addressed:

- Actualize the MIS curricula, in order to get aligned with business needs and concerns;
- Foment more MSc. and PhD. in the area and outside the university;

In summary, IT Governance and IT Service Management is the future of IT. IT needs to payoff and it's time to do so.

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