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# An Evaluation of ISO 9001 and BPM in Amadeus

*Master of Science Thesis in the Master Degree Program, Quality and Operations Management*

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Göteborg, Sweden, 2012
Report No. E2012:085

MASTER'S THESIS E2012:085

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Chalmers reproservice
Göteborg, Sweden 2012

## Abstract

Purpose - The purpose of this study is to understand how ISO 9001 and BPM are positioned relative to each other and how they can be applied together in Amadeus. It is also aimed to identify the critical elements in BPM implementation and to provide recommendations for successful BPM implementation accordingly.

Methodology – Literature review was performed to develop a set of statements with regard to the definition, success factors of BPM and the contribution of ISO 9001 and BPM to TQM principles. The empirical data were collected through semi-structured interviews and from people that work on or are knowledgeable about ISO 9001, BPM or both of them. Through analysis of the empirical data and the literature the research questions were answered.

Findings – The results show that ISO 9001 and BPM can and should be applied together in order to get closer to TQM. The areas that ISO 9001 and BPM can be applied together are discussed extensively.

Delimitation – This research is limited to the data from Nice site of Amadeus and also to the evaluation of ISO 9001 and BPM relative to each other. Although there are other similar programs in Amadeus that can be included in such study and bring more insights about the role of these similar programs in approaching the company to TQM, such programs are not included in this research.

Keywords: ISO 9001, BPM, TQM

## Acknowledgement

The ideas, insights, and results of this research project should not be attributed to my personal efforts alone. Rather, to a large extent, this thesis is the result of many contributions made by several people in several ways.

First, I would like to express my gratitude to my academic supervisor, Sverker Alänge, for his guidance and advice throughout the thesis work. I am also grateful to Christian Apitzsch, my supervisor in Amadeus, for his advice through this study and for sponsoring my work. I also would like to thank Chantal Sini, a member of the Quality Management and Compliance team, for her advice and help throughout my thesis work.

Finally I would like to express special thanks to all the people who agreed to be interviewed without which this research would not have been possible. I would like to thank them for all their help, support, interest and valuable hints.

Tehran, September 2012

Sahar Kazemi

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# 1 Introduction

## 1.1 Background

When there are parallel programs with similarities such as two quality management programs within an organization it is important to study the relationship between them and understand the inter-dependencies among them (Carri, 2011). It is also essential to link them together and if possible integrate them. Ignoring this will create confusion within the organization and will create silos that their efforts might not be aligned together or might be duplicated. This will create waste and will avoid reaching the intended benefits of these programs (Ibid).

Amadeus has recently started to deploy Business Process Management (BPM) as an approach to improve the overall business performance by building enterprise-wide, sustainable, and end to end Business Process Management capabilities. Amadeus also holds ISO 9001 certification since 1998. The current certification is based on the latest version of the standard which is 2008 version. Studying how ISO and BPM are positioned relative to each other and whether they can work together is an important subject that will help Amadeus to better understand the different roles of each program. It will also assist Amadeus in decision making by a clarification on the contributions that any of the two programs will provide.

From theoretical point of view this study will provide an analysis of ISO 9001 and BPM and will elaborate on how the two approaches can be applied together. There are useful literatures and researches about each of the two programs but we lack studies that analyze them in comparison to each other or investigate how they could be applied together.

## 1.2 Purpose

The purpose of this study is to understand how ISO 9001 and BPM are positioned relative to each other and how they can be applied together in Amadeus. It is also aimed to identify the critical elements in BPM implementation and to provide recommendations for successful BPM implementation accordingly.

## 1.3 Research questions

The research questions that will be answered in this study are:

- How are ISO 9001 and BPM positioned relative to each other?
- Do they complement each other? If yes, how?
- What are the suggestions for successful BPM implementation?

## 1.4 Delimitation

This study is limited to the evaluation of ISO 9001 and BPM relative to each other although there are other similar programs in Amadeus that can be included in such study and bring more insights about the role of these similar programs in approaching the company to Total Quality Management (TQM). CMMI for example is a process improvement approach and is applied in some departments in Amadeus. The study of CMMI relative to ISO 9001 and BPM is not included in this research.

Another delimitation of this study is about the Amadeus sites studied in this research. Amadeus operates world-wide and has different sites around the world. For this research the site located in Nice, France has been studied.

# 2 Methodology

## 2.1 The research process

To select the subject of this study several brainstorming sessions were conducted with my supervisor in Amadeus, one of the members of Quality Management and Compliance, and BPM team and also my academic supervisor. Based on my interest and the need of Amadeus in developing a better understanding of ISO 9001 and BPM, I decided to research about these concepts and clarify their roles in making Amadeus a more quality-oriented company. The research questions were selected to address the aim of the study and to make the investigation easier. This was followed by extensive literature review about BPM as it is not a very clear concept. When a better understanding of BPM was achieved I started collecting the practical data through semi-structured interviews and document reviews. By collecting the data I tried to understand the interviewees' opinion about BPM and ISO as separate concepts and also as two concepts that can be evaluated relative to each other. For example I asked interviewees' opinion about the definitions of BPM and ISO 9001 and about the areas in which ISO 9001 and BPM can be applied together. You can find the list of interview questions in the appendix.

The results of the interviews allowed me to come up with ideas about how BPM and ISO 9001 are positioned relative to each other however there was a need to conduct more literature review about their position through the lens of academic researches. As there was very few literatures in this area I decided to approach this subject through developing an understanding about how ISO 9001 and BPM contribute to Total Quality Management (TQM) principles. This selection was affected by the results of the interviews. Because through interviews I could better understand that in which areas of quality management ISO 9001 and BPM are stronger. For example through interviews it was found that BPM is stronger in developing process approach compared to ISO 9001. Evaluation of ISO 9001 and BPM contribution to TQM principles allowed me to develop ideas about the areas in which ISO 9001 and BPM can be applied together. This was complemented by the opinions of the interviewees and resulted in the findings of this study. In order to have more reliable results in evaluating the contribution of ISO 9001 to TQM principles one student in an MBA program and knowledgeable about quality management assisted me through doing the evaluation by studying the ISO 9001 standard and scoring the contribution of sections 5 to 8 in the standard to each TQM principles. The result of his evaluation was compared to the result of my own evaluation. The results were very similar and a single evaluation achieved through discussing the differences and arriving at consensus.

## 2.2 Research design and strategy

This study is based on the case study design. According to Bryman and Bell (2003) case study design is an in-depth analysis of an individual case. The case study research design is attractive due to the availability of the sample of study and the possibility to do a more reliable research (Remenyi et al.,

2002). Being an intern in Amadeus for one year allowed me to do an in-depth analysis about the subject of the study in Amadeus.

The research strategy is a general plan of how to go about answering the research question (Saunders et al., 2007). It should have a clear objective which is derived from the research question and should be appropriate for answering the research question on hand. Bryman and Bell (2003) divide research strategy into two different clusters: quantitative and qualitative research. Quantitative research focuses on quantification in data collection and analysis. On the other hand the focus in qualitative research is on words. As these authors explain quantitative research involves a deductive approach with an emphasis on theory testing and qualitative research has an inductive approach emphasizing the generation of theory. In this research in order to answer the research questions the qualitative strategy is selected. This is the suitable strategy considering the research questions and the field of study. Through this research it is attempted to understand the feelings and opinion of the interviewees based on their knowledge and experience. As details about feelings and thoughts are investigated, qualitative research is ideally suited for this research.

Through semi-structured interviews the qualitative data were gathered for this research. The interviewees were selected based on their knowledge and experience about ISO 9001 and BPM. The position of the interviewees is presented in the following table:

| Interviewee position | Number of interviewees |
|---|---|
| **ISO 9001 Internal Auditor – Quality Manager – Head of the QMC Team** | 5 |
| **BPM manager – Head of the BPM team** | 5 |
| **Previously ISO 9001 Internal Auditor** | 1 |
| **External BPM Consultant** | 1 |

**Table 1:** Interviewee position

The total number of interviews conducted is 10. Two of the interviewees had two roles, ISO 9001 Internal auditor and BPM Manager. The interview questions were slightly different depending on the role of the interviewee. Most of the questions for the external BPM Consultant were different from the other interviewees. The most part of the data collected from the external Consultant was regarding their BPM framework and their approach to BPM.

All of the interviews were recorded and transcribed for analysis. The analysis of the interview data was done through categorizing the information into a number of clusters.

The data from interviews were supplemented by the data from observations and documents review. My observations include the way that internal auditors approach an ISO 9001 audit interview and their interpretation of ISO 9001. The documents review includes studying the documents relevant for this research in the quality management system and previous student researches in Amadeus.

## 2.3 Reliability and validity of the research

According to Bryman and Bell (2003) reliability refers to the consistency of a measure of a concept and validity refers to the issue of whether or not a measure of a concept really measures that concept. Reliability and validity of a research are evaluated extensively for quantitative research and are

extended to be used in qualitative research as well. According to Bryman and Bell (2003) internal reliability refers to whether there is more than one observer, members of the research team, agreeing about what they see and hear; and external reliability refers to the degree a research can be completed for a second time with results comparable to the original study. The internal reliability of this research is low as it was conducted by one person. Although the external reliability as discussed by Bryman & Bell (2003) is difficult to maintain in qualitative research this research has sufficient external reliability since it is not difficult to recreate the same settings in order to replicate the study. Some parts of this research can be compared to the results of the previous researches in Amadeus and the data collected through observation. This comparison shows that this research is reliable since the data collected through interviewees are consistent with the data collected through studying previous researches and observation of the author. For example the fact that Amadeus is vertically-oriented is supported in previous researches.

As was mentioned validity refers to the issue of whether or not a measure of a concept really measures that concept. Validity of this research was maintained through a detailed and careful examination of the kind of data required to answer the research question. Triangulation is the way to establish the validity of findings by using multiple data collection devices, sources, analysts, etc... Triangulation of data collection also helped in maintaining the validity of this research since the data collected through documents review and observation complemented the data collected through interviews.

# 3 Theoretical framework

In this section a framework will be presented that clarifies what needs to be considered if management initiatives are to be practiced in reality. The concepts of Business Process Management (BPM), quality management and ISO 9001 will be introduced as well. Finally, the contribution of ISO 9001 and BPM to Total Quality Management (TQM) principles will be presented and will subsequently serve as an important theoretical guide for this study.

## 3.1 Management initiatives, how they influence on behavior

Marmgren et al. (2012) have researched about the structures that make a management initiative to be practiced in reality and be integrated into the behavior of people. *In practice, the development of a "management system" may be limited to a structure of documents and connected actions, which meets requirements based on a certain norm. A risk is thus, that the initiative ends up in a mainly normative and document oriented work, creating a type of virtual reality that does not drive actions on genuine needs* (Ibid). We need to understand what structures influence the way we work. A framework has been developed that presents these influencing structures and their relationships:

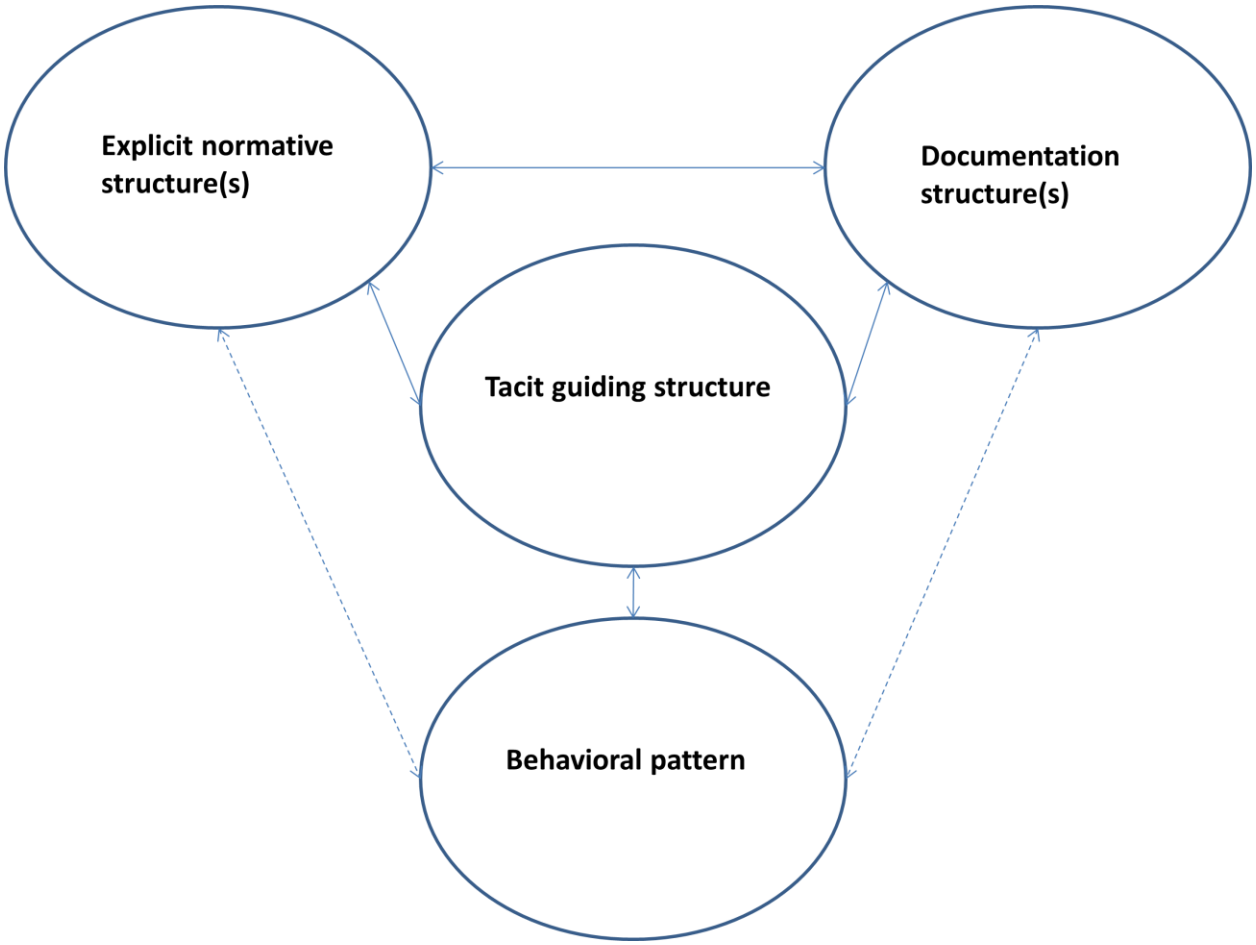


**Figure 1: framework for management initiatives (Marmgren et al., 2012)**

According to Marmgren et al. (2012) this framework is constituted of three structures, explicit normative, documentation and tacit guiding structures and also the behavioral pattern. The three structures influence the behavior and the way people act. The structures also influence each other and behavior in turn influences the three structures. The reason that the relationship between documentation and explicit normative structures and behavioral pattern are in dotted line is that this relationship is weak compared to the relationship between tacit guiding structure and behavioral pattern. The chances that an approach be practiced in reality are higher when it is integrated to the tacit guiding structure.

### 3.1.1 Documentation structure(s)

Documentation structures are a set of documents regarding certain system, such as the documents related to ISO 9001 or they can include *a description or visualization of a management model, a process or a physical reality. The documentation can for example be in the form of a process map, descriptions, checklists, explicit requirements on a product, contracts, etc* (Marmgren et al., 2012). some people refer to documentation structures when they talk about management systems but according to the framework documentation structure is only one of the structures of management systems.

As discussed by Marmgren et al. (2012) there can be multiple documentation structures which might not be coordinated *e.g. ISO-related process maps and procedures in parallel with "informal" templates, checklists, etc., that are actually the ones used.* This is not the intention of any management system and there should be coordination between different documentation structures.

### 3.1.2 Explicit normative structure(s)

This structure is apparent when managers advocate a certain approach and communicate about it. As explained by Marmgren et al. (2012) *explicit normative structures are expressions of how things should be done. They are naturally less specific and more complex than what is documented*. Two examples of explicit normative structures are when a management team meets and agrees on certain central ideas to promote in the organization or towards other stakeholders, or when a manager is presenting a strategy for business development, marketing, or organizational development.

Sometimes there is not a good correspondence between documentation structure and explicit normative structure. This happens when management does not formally support the adopted frameworks or standards.

### 3.1.3 Tacit guiding structure(s)

As discussed by Marmgren et al. (2012) *Tacit guiding structures are guiding individuals´ behavioral patterns, and they are also guiding behavioral patterns within groups and among groups of persons.* These structures are informal structures that exist in the organization and cannot be directly observed, they can be seen when e.g. a person behaves in a defined way in a similar situation.

Marmgren et al. (2012) argue that if we want something to be practiced in reality and be part of our behavior it has to be integrated into a tacit guiding structure. *This means that in order to be effective and influence practice, the documented structure and the normative structure have to be integrated into the more complex tacit guiding structure* (Ibid).

### 3.1.4 Behavioral patterns

According to Marmgren et al. (2012) behavioral patterns are patterns of actions, the way that we actually act and things are done. Behavioral patterns are very much affected by tacit guiding structures; these structures that are leading us are actually reflected in the way we behave. They lead managers e.g. to prioritize resources, take actions… these are the real actions that happen practically and define the behavioral patterns.

The relationship between explicit normative structure and tacit guiding structure is weak when managers communicate about certain approach and support it informally but they orientate in another way in reality. They might be supportive about the approach but this support is not tangible and accompanied by resources. As discussed by Marmgren et al. (2012) there might be also situations in which there is not a good correspondence between documentation structure and tacit guiding structure. *In documentation certain ways of working may be described although in practice another way of working may be predominant* (Ibid).

In these situations what is documented and expressed through normative structure will have limited impact on the tacit guiding structure and therefore on the way that we actually behave.

## 3.2 Business Process Management

### 3.2.1 History

Process management and working with processes has been in use since late eighties. Geary Rummler was one of the business process gurus of the 1980s. Together with Alan Brache, at the end of eighties they wrote the book "Improving Performance: How to Manage the White Space on the Organization Chart" and they developed a system view on organization that is constituted by processes which need to be analyzed and improved. The emphasis was on the processes and managing them as a whole; they argued that many process problems arise when departments hand over the work to the next department and there is no consideration about how the process should benefit from the collaboration between different departments (Rummler and Brache, 1995).

In early nineties business process reengineering was introduced by Hammer and Davenport and as it is defined it their book it's about breakthrough change programs, it's about starting from a blank sheet and completely redesigning main business processes in order to achieve huge performance improvements.

This is to mention that process management was around for some times, however the book "BPM: the third wave" by smith and Fingar (2002) created significant attention to Business Process Management; Jeston and Nelis (2008) attribute the BPM movement to the time that this book was published.

### 3.2.2 Definition

It is difficult to define Business Process Management. The term means different things to different people like business process consultants, business analysts and software developers. Here are some examples of the definitions:

According to Zairi (1997) BPM is *a structured approach to analyze and continually improve fundamental activities such as manufacturing, marketing, communications and other major elements of a company's operation*.

Smith and Fingar (2003) define the BPM as:

*BPM is the convergence of management theory - total quality management, Six Sigma, business engineering and general system thinking - with modern technologies-application development, systems integration, computation, service-oriented architecture, workflow, transaction management, XML and Web services.* From business perspective they further explain that BPM aligns processes more directly with organizational objectives and allows companies to represent their source of competitive advantage and differentiation. BPM provides end-to-end process visibility and accountability, removes redundancies and increase automation of simple support processes such as human resources and complex processes such as product design (Ibid).

**Jeston and Nelis (2008) define BPM as:**

***The achievement of an organization's objectives through the improvement, management and control of essential business processes.***

They explain all of the words in their definition as following:

**Achievement**: Realizing the strategic objectives as outlined in the organization's strategic plan. At a project level, it is about realizing the value or business benefits as outlined in the project business case.

**Organization**: The organization in this context refers to an enterprise or parts of an enterprise, perhaps a business unit that is discrete in its own right. It is the end-to-end business processes associated with this part of an organization. This end-to-end focus will ensure that a silo approach does not develop.

**Objectives**: The objectives of a BPM implementation range from the strategic goals of the organization through to the individual process goals. It is about achieving the business outcomes or objectives. BPM is not an objective in itself, but rather a means to achieving an objective. It is not 'a solution looking for a problem'.

**Improvement**: Improvement is about making the business processes more efficient and effective.

**Management**: Management refers to the process and people performance measurement and management. It is about organizing all the essential components and subcomponents for your processes. By this we mean arranging the people, their skills, motivation, performance measures, rewards, the processes themselves and the structure and systems necessary to support a process.

**Control**: BPM is about managing your end-to-end business processes and involves the full cycle of plan–do–check–act (Deming circle). An essential component of control is to have the ability to measure correctly. If you cannot measure something, you cannot control and manage it.

**Essential**: Not every process in an organization contributes towards the achievement of the organization's strategic objectives. Essential processes are the ones that do.

**Business**: An implementation of BPM must have an impact on the business by delivering benefits. It should focus on the core business processes that are essential to your primary business activity – those processes that contribute towards the achievement of the strategic objectives of the organization.

**Processes**: What is a process? There are as many definitions of process as there are processes. One we agree with is Roger Burlton's, where he says that 'a true process comprises all the things we do to provide someone who cares with what they expect to receive' (Burlton, 2001: 72). This covers a true end-to-end process, from the original trigger for the process to the ultimate stakeholder satisfaction. Burlton adds that the '… final test of a process's completeness is whether the process delivers a clear product or service to an external stakeholder or another internal process'.

The fact that there are different definitions of BPM and that there is no complete consensus on its meaning is a negative point for BPM. As we saw Smith and Fingar (2003) and some other authors include the IT component also in the definition of BPM.

After reviewing some literature about BPM the definition of Jeston and Nelis seems to be more comprehensive and precise and therefore this definition will be used in this research. I will also elaborate on the IT component in BPM as it is highlighted in many literatures.

### 3.2.3 IT component in BPM

In most of the literatures about BPM there is a section dedicated to use of IT in BPM and some authors such as Smith and Fingar, see the IT role very important. But it is stated by several authors that IT shouldn't come in the beginning; first we need to identify processes and improve them and then if possible use IT systems. Jeston and Nelis (2008) state: *in our experience, technology should not be the initial focus in a BPM implementation. The initial work should relate to reviewing the current processes with a goal of increased efficiency and effectiveness.*

*The volume of work and the complexity of the business process demand that organizations look for possible IT applications to support and automate their processes* (Jeston and Nelis, 2008). According to Smith and Fingar (2003) BPM implementation should be in collaboration with IT. They discuss that IT organizations will bring their years of experience with general systems thinking to problems of business innovation. Previously, business process modeling was developing models that could not be used as requirement specifications for developing software applications and this was creating problems in software development process and it created discrepancy between business and IT models. Business Process Management instead is based on a single model architecture that should be shared and maintained over the life cycle of any business process (Ibid).

Mapped processes are important documents in BPM. There are a number of tools such as Visio or PowerPoint that are used for mapping the processes. These types of tools are easy to understand and use but they cannot act as a repository that can save information about the processes or link them together. Therefore they are useful for separate business processes. Business Process Modeling tools (BP Modeling tools) help organizations to define and document processes and also to save information about them. This way processes can be updated if there is a change in the process and they are easy to maintain (Smith and Fingar, 2003).

Jeston and Nelis (2008) argue that there is a risk that organizations think buying a process-modeling tool will solve all of their problems and they will start process improvement afterwards. But the fact is that a process-modeling tool is just a tool and can facilitate process improvement.

### 3.2.4 Implementation

Jeston and Nelis (2008) believe that BPM is not simple at all; they believe that it is very difficult and *there are many components and elements to a BPM implementation.* They suggest starting with one project and do not expect to do one-time BPM implementation.

In the BPM literature there are several approaches or methods for BPM implementation. These approaches are very similar and usually they vary only in some points. In this section a common

approach that is based on the approaches discussed by Elzinga et al. (1995), Pritchard and Armistead (1999), Jeston and Nelis (2008) and Harrington (1995) will be presented.

BPM implementation firstly requires the strategy and guiding principles for the enterprise to be defined and known by all employees. The existence of business strategy and the vision and mission statements are very important for staring BPM work. As argued by Jeston and Nelis (2008) before staring improvement of the processes objectives and strategy of the business should be defined and agreed upon. Zairi (1997) also argues that *the achievement of a BPM culture depends very much on the establishment of total alignment to corporate goals and having every employee's efforts focused on adding value to the end customer*. The team assigned for improving the process should know if they are heading to the right direction and ensure that the process will contribute to the strategy and objective of the business. If the strategy does not exist explicitly (it is only in the heads of management) it should be first defined and communicated so that the BPM projects are aligned with business strategy.

Elzinga et al. (1995) propose to define a set of critical success factors (CSFs) to be able to focus on the vision, mission and goals of the organization. CSFs are those actions that are necessary to enable an organization to achieve its goals. With the CSFs defined it is clearer for the organization in which areas to focus. This will be very helpful for the process selection that will be explained later.

Building up process architecture is the next important element in BPM implementation. *Process architecture is developed as a means of understanding organization* (Pritchard and Armistead, 1999). Michael Porter's value chain model is said to be the first model that presented the way an organization delivers value to customer. Process architecture is a similar illustration that shows how an organization delivers value for customers and how it makes money. In process architecture there can be more than one value chain depending on the company products and services. For a process architecture a set of top-level business processes that describe the business are to be defined. These processes usually entail core business processes and support processes. Support processes do not directly contribute to delivering value or making money but without them the value chain(s) containing core processes cannot function.

As discussed by Jeston and Nelis (2008) *a good process architecture will ensure that more time and effort is saved by its use. It will also provide a means of communicating, specifying and agreeing the process objectives and principles in a way that it is clear for everyone*. The first step in building the process architecture is to involve top management and stakeholders so that they all will provide inputs, will have consensus on it and will use it. The usage of the architecture is the measurement of its success. *The process architecture will need to adjust to business requirements and thus it will need to be dynamic, rather than the static architectures of the past* (Ibid).

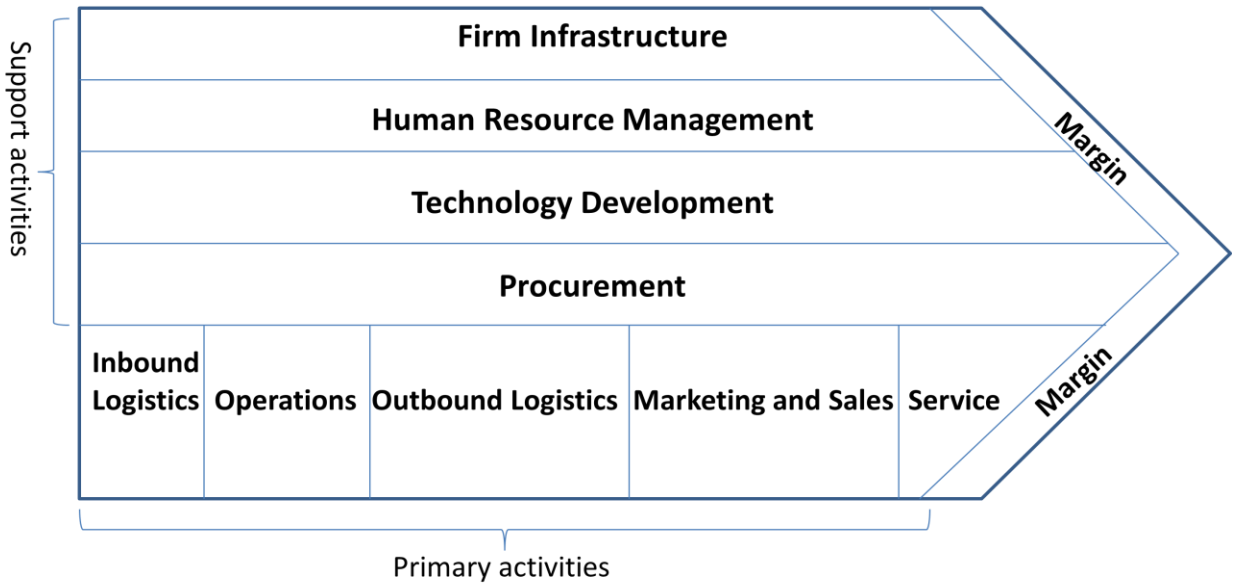


**Figure 2: Michael Porter's value chain model**

The next step in BPM implementation is selecting and ranking core processes among several processes for deep analysis and improvement. Focus on core processes is vital to the success of BPM (Armistead et al., 1999). As mentioned earlier the role of CSFs is essential here because they will guide the selection process since they make it clear what processes are essential for the business goals.

Assigning process owner is very critical in BPM implementation and is discussed by many authors (e.g. Elzinga et al. 1995, Pritchard and Armistead 1999, Jeston and Nelis 2008, Armistead and Machin 1997). Armistead and Machin (1997) report the result of their research on a number of companies that are considered excellent against process management. Process owners and process groups as they discuss were the common element in those companies. Process owner can be an individual or a team that has the responsibility for the process end to end to avoid the boundaries inside the process. Armistead (1996) discusses that another important role of process owner is to interface with other processes to avoid making process silos.

The next step is describing the selected process for improvement and documenting it. *Without a precise documentation of the process, there are often conflicting views of what the process actually is and what it is doing* (Elzinga et al., 1995). It is important to do this task together with the team responsible for that process. If there is no consensus on what the process constitutes this task should help defining the process correctly that is agreed by the people concerned. There are some tools for performing this task such as flowcharts. Computerized tools are more effective since they allow the update of the process easily and in some tools there are the possibilities to connect different processes and measure the performance. One important outcome of this step is AS IS process map.

The next step is to quantify the process. Metrics for different activities making the process or sub processes should be defined and measured. Then the team should define targets for improving the

process. One helpful tool in this step is value stream mapping. With this tool value-added and non value-added activities will be identified. The aim is to remove non value-added activities. Other tools that visualize the performance of the process such as Pareto charts and Histograms are useful as well.

Armistead and Machin (1997) argue that *measurement is a key principle to managing processes*. Their research on a number of companies excellent in process management showed that these companies are giving importance to measure of customer satisfaction and loyalty. They also developed and used measures of efficiency instead of only measuring if the process is delivering the aimed results.

Pritchard and Armistead (1999) discuss that top level BPM strategy should be integrated with team level activity and that can be done through performance measures. High level goals and objectives should be translated and cascaded down to the operational levels. Therefore high level objectives of the organization should be translated to metrics for the selected high level process. Low level metrics for the sub processes in the operational level should then be defined and aggregated for the end to end process.

As argued by Armistead and Machin (1997) it is important to first define high-level measures and then define detailed low-level ones and relate them to those high-level measures. in their research they observed that in some cases detailed measures were implemented into lower-level process maps, directly related to processes, however, this resulted in a large number of measures that it was then difficult to prioritize, because, at a higher level, measures had not been (or had not been properly) defined.

The next step in BPM implementation is to select between improvement opportunities. This requires financial justification of the selected opportunity with tools such as cost-benefit analysis. The selection process preferably will be a group decision making process. The information gathered through previous steps and any other information about the activities in the sub processes should be aggregated to be used in the decision making process. Elzinga et al. (1995) believe that the decision making process should be carried out in as structured form as is possible and they suggest using documented decision aids for this purpose.

The next step is to implement specific improvements based on the selected improvement opportunities. The TO BE process map should be drawn with refined measures previously established and in some cases new measures will be defined. As discussed by Elzinga et al. (1995) once the improvement is implemented it should be monitored over time to verify whether the aimed results are gained and maintained.

After the improvement is implemented, the process should be considered for continuous improvement and further improvement opportunities should be acted upon. The BPM implementation can be repeated from process selection step. Other processes that are essential for objectives of the organization should be improved through BPM implementation.

### 3.2.5 BPM limitations

The most common limitations of BPM that have been discussed in the literature are:

**Lack of clarity** – *There is considerable debate about what business process management means and how organizations interpret the business process paradigm* (Armistead and Machin, 1997). Hung (2006) discusses that BPM as a field of study is still in its infancy and there are not many researches about it. It is also discussed by Pritchard and Armistead (1999) who researched about companies applying BPM that Lack of understanding of BPM was regarded as a big difficulty for them. As discussed by Armistead et al. (1999) the resulting ambiguity leads to a lack of shared understanding shown in confusion, frustration and wasted effort.

**Man-hours involved** - Elzinga et al. (1995) argue that the numbers of man-hours involved in a BPM project are high and considering that the BPM benefits will be achieved in a long term period assigning resources are not easily welcomed by managers.

### 3.2.6 Success factors of BPM

In BPM literature there are a number of elements that are repeatedly named as critical success factors of BPM or Process Management. Perhaps Armistead (1996) belief can best describe the importance of people, processes and system in BPM: *It has consistently been my belief that business process management only works when attention is given to people, processes and systems in the context of the organization structure and organizational culture.* The following list of BPM success factors are developed based on reviewing a number of researches on BPM (Armistead, 1996; Hung, 2006; Pritchard and Armistead, 1999; Armistead and Machin, 1997; Armistead et al., 1999; Ittner and Larcker, 1997; Lee and Dale, 1998; and Balzarova et al., 2004).

**Executive commitment**

Every change initiative requires top management support and commitment. Without top management commitment the BPM effort will not be a success (Hung 2006). Elzinga et al. (1995) report that one of the major problems encountered in the implementation of process management is attributed to a lack of management concentration. Harrington (1995) believes that BPM is fundamentally a senior management objective; however there are debates among authors that the role of employees and their involvement is also critical for BPM and focus on management can undermine the important role of employees. In general the importance of both executive and employees involvement is discussed by many authors.

**Organizational culture**

BPM requires systematic structural change but it is important to note that implementing BPM will not be successful only with a change in the structure; it requires a process-based culture that will enable the implementation (Zairi, 1997). Majchrzak and Wang (1996) conducted a research on U.S. electronic manufacturers and they found that process-complete departments that passed through different departments (departments that were responsible for most manufacturing steps, support tasks, and interfaces with customers) did not necessarily have faster cycle times than functional departments. The only ones that had faster cycle times were those whose managers had taken steps to

promote a collective sense of responsibility among workers that went beyond merely changing the organization's structure.

Rosemann et al. (2004) have identified culture as a critical success factor in BPM implementation. Consistent with this point, a research conducted by Forrester Group identified cultural resistance as the major reason for BPM project failure (Savvas, 2005). This resistance can result from lack of process understanding and intendancy for collaboration (Brocke and Sinnl, 2011).

Zairi (1997) provides some suggestions for developing a BPM culture. Continuous improvement and performance measurement are among those suggestions. Brocke and Sinnl (2011) in their research about BPM culture identified values such as consistency, quality, continuous improvement, customer orientation, process orientation and responsiveness to change as organizational values supporting BPM culture.

Developing a culture of team work is also essential for BPM (Balzarova et al., 2004). Armistead and Machin (1997) report that the formation of cross-functional teams in BPM implementation appeared critical to the success of the organizations they researched. According to Armistead (1996) Process management is about teams rather than individuals and therefore a team-work culture carries a suitable background for BPM. Reward system should also be in line with the team-work environment and should move from individual reward system (Majchrzak and Wang, 1996).

Armistead (1996) argue that training and skill development for individuals and teams will affect change in the culture of organization. Therefore training plays an important role and many authors have emphasized this (e.g. Pritchard and Armistead 1999, Ittner and Larker 1997, Balzarova et al. 2004). Training on end to end processes, problem solving and cross-skill training that allow flexibility of employees are types of trainings that are useful in transition to process based management.

Reward and recognition systems are influential in acquiring the desired culture. According to Armistead (1996) for BPM rewards and recognition should be set in accordance with performance of the processes. *Without changes in measure and reward the benefits from the new process will probably be lost* (Ibid).

**Change management and communication**

Balzarova et al. (2004) believe that *the effective and efficient management of the change initiative is essential for the successful transition from a functional to a process management approach to managing the business*. The case studies that Pritchard and Armistead (1999) have studied suggest that *BPM should be tied in with some kind of change management process if it is to survive.* Elzinga et al. (1995) discuss that accepting the change in BPM implementation is difficult for employees and it should be managed. Involvement of people during implementation is very important if organizations are to excel in BPM and also in managing the change (Elzinga et al., 1995; and Hung, 2006).

Hung (2006) discusses that empowerment of employees is essential for BPM. According to Pickering & Matson (1992) Empowerment means *building a shared vision of where we want the organization to go and constructing an organizational culture and climate with operating values that enable all employees to participate actively and creatively in pursuing the vision.* Empowerment will motivate employees and reduce their resistance to change (Hung, 2006).

Communication is another important element in BPM implementation. Pritchard and Armistead (1999) in their research on companies well progressed at BPM and companies at early stage of BPM implementation report that the ambiguity about BPM is one of the difficulties that companies faced. This highlights the importance of defining and communicating about BPM. Furthermore, communication and awareness about BPM and its benefits reduce the barriers to change. According to Balzarova et al. (2004) effective communication includes encouraging and maintaining employees' enthusiasm and full participation, defining and understanding roles and responsibilities in processes and motivating people to work on their full potential.

**Clarity of BPM approach**

Pritchard and Armistead (1999) in their research on companies at early stage of BPM implementation report that the majority of respondents identified lack of understanding of BPM as the single most difficult factor they had encountered in implementing a BPM approach. They also report that their research on companies well progressed at BPM shows that lack of consistency in the approach to BPM across the organization and confusion or ambiguity between functions and processes were the most referred difficulties in BPM implementation. Ambiguity of BPM is therefore a major problem and should be resolved by clarifying on what BPM is for managers and employees. Defining and sharing BPM definition in the organization is helpful. Pritchard and Armistead (1999) warn that *the inability of an organization to determine and communicate its view of processes or the way it intends to use that perspective can create a level of cynicism among its members which may be difficult to overcome by the time they are asked to implement that strategy.*

**Time**

Adopting a process perspective takes significant amount of time and may be a long term objective (Balzarova et al., 2004). Motivating key stakeholders and managers to work and manage based on cross-functional processes is not an easy and straightforward task. For managers that have been managing based on functions moving to process management is different and challenging. *The power base of senior managers has been in functions. The career path of individuals has been through functions. Abandoning this structure challenges the way organizations work* (Armistead, 1996). Therefore it is important to allow time to acquire a process perspective.

**Performance measurement**

As many authors discussed measurement is a key principle of managing by processes and is central to successful approaches to business process management (e.g. Armistead and Machin, 1997; Hung, 2006; Balzarova et al., 2004; Armistead et al., 1999; Melan, 1989). As Armistead (1996) discusses

key measures are the ones that people at the next step in the process use to judge your team and which influence the attainment of performance against key customer-based measures.

Lee and Dale (1998) believe in the importance of the measurement as well but warn that if everything gets measured, nothing gets done. They argue that many companies are obsessed with measurement but producing too many measures is not ideal and it will avoid focusing on the core measures of the processes. Therefore developing measures should only be based on the objectives and they should be as an input for decision making and not being developed only for having measures.

## 3.3 Quality management

### 3.3.1 Quality concept

There are several definitions for quality in the literature. Deming, Juran, and Crosby are among the gurus of quality management field and they define quality respectively as:

*A product or service… that helps somebody and enjoys a good and sustainable market* (Deming, 1986)

*Fitness for use* which means a product or service should do what the user needs or wants (Juran and Gyrna, 1980)

*Conformance to requirements* (Crosby, 1980)

Bergman and Klefsjo's (2003) definition of quality is: *the quality of a product is its ability to satisfy or preferably exceed customer needs and expectations of a product.*

These authors have approached quality subject from almost different perspectives but there are elements that they all have emphasized. Those areas include the role of top management, process management and employees' involvement. Saraph et al. (1989) have systematically studied and synthesized the quality management literature. Three elements mentioned earlier are among the factors that they have found essential for quality management based on the literature and practice.

### 3.3.2 Total Quality Management and its principles

TQM is defined in BS 4778 Part 2 as: A management philosophy embracing all activities through which the needs and expectations of the customer and the community, and the objectives of the organization are satisfied in the most efficient and cost effective way by maximizing the potential of all employees in a continuing drive for improvement. According to Bergman and Klefsjo (2003) TQM principles are as following. International Organization for Standardization defines the followings as the quality management principles as well.

**Customer focus**

*Organizations depend on their customers and therefore should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations* (International Organization for Standardization).

This principle is at the heart of the total quality management framework and has been highlighted by many authors in quality management field. Understanding customers' expectations and needs and meeting them are essential for a supplier. Establishing good relationship with important customers and receiving their feedback helps increasing the quality of the product. Hoyle (2007) argues that being customer focus means that you put your energy to satisfy your customers and the profit comes in when you increase the customer satisfaction. *A profit focus is an inward seeking focus; a customer focus is an outward seeking focus*. If you focus on profit and don't pay attention to customer needs you are not a customer focused company. *If people were to ask themselves before making a decision, what does the customer need or expect? – the organization would begin to move its focus firmly in the direction of its customers.* This principle means that not only the top management but all employees should be customer focus (Ibid).

According to Hoyle (2007) an organization applying the customer focus principle would be one in which people:

- *Understood customer needs and expectations.*
- *Met the needs and expectations of all stakeholders.*
- *Communicated these needs and expectations throughout the organization.*
- *Have the knowledge, skills and resources required to satisfy the organization's customers.*
- *Measured customer satisfaction and acted on results.*
- *Managed customer relationships.*
- *Could relate their goals and targets directly to customer needs and expectations.*
- *Acted upon the results of customer satisfaction measurements.*

**Leadership**

*Leaders establish unity of purpose and direction of the organization. They should create and maintain the internal environment in which people can become fully involved in achieving the organization's objectives* (International Organization for Standardization).

Top management commitment is a central element for quality management. Garvin (1986) reports strong top management commitment as vital for product quality. This principle refers to continuous management support for quality work and management action as a role model consistent with the organization values. As Hoyle (2007) argues culture, values and vision of an organization arises from leaders; setting them and acting in accordance with values and vision will allow people to know what the organization is trying to do and to have a role model to get affected by. This element of the quality management also includes establishing rewarding schemes based on quality performance which has been found very essential (Flynn et. al, 1994).

According to Hoyle (2007) an organization applying the leadership principle would be one in which leaders are:

- *Being proactive and leading by example.*
- *Understanding and responding to changes in the external environment.*

- *Considering the needs of all interested parties.*
- *Establishing a clear vision of the organization's future.*
- *Establishing shared values and ethical role models at all levels of the organization.*
- *Building trust and eliminating fear.*
- *Providing people with the required resources and freedom to act with responsibility and accountability.*
- *Promoting open and honest communication.*
- *Educating, training and coaching people.*
- *Setting challenging goals and targets.*
- *Implementing strategy to achieve these goals and targets.*

**Involvement of people**

*People at all levels are the essence of an organization and their full involvement enables their abilities to be used for the organization's benefit* (International Organization for Standardization).

People in the organization are important resources and their involvement is essential for the company. Establishing an environment that empowers employees and encourages their involvement and commitment allows them to work with their full potential and will provide employees satisfaction which in turn will help increasing satisfaction of customers. Hoyle (2007) argues that every person has potentials, knowledge and experience over what she has been asked to do in her job and this principle means that management should tap these potentials and as mentioned before provide the environment in which people can work up to their full potentials.

According to Hoyle (2007) an organization applying the involvement of people principle would be one in which people are:

- *Accepting ownership and responsibility to solve problems.*
- *Actively seeking opportunities to make improvements.*
- *Actively seeking opportunities to enhance their competencies, knowledge and experience.*
- *Freely sharing knowledge and experience in teams and groups.*
- *Focusing on the creation of value for customers.*
- *Being innovative and creative in furthering the organization's objectives.*
- *Better representing the organization to customers, local communities and society at large.*
- *Deriving satisfaction from their work.*
- *Enthusiastic and proud to be part of the organization*.

**Process approach**

*A desired result is achieved more efficiently when activities and related resources are managed as a process* (International Organization for Standardization).

This principle highlights the importance of identifying the processes and managing them. People need to know what outputs they should create through processes; they should define measures of

success and the critical activities to achieve the desired results. This principle also encourages process approach when there are processes that pass through different functions in the organization. Having a process approach allows coordination and effective management of interrelated processes. *The organization exists to create and satisfy customers and other stakeholders therefore the organization's processes must serve the needs of these stakeholders* (Hoyle, 2007). For reaching the desired outcomes not only the processes and their activities, required resources and competences need to be identified but this element also means that the ways to better execute and manage the processes need to be sought; this highlights the importance of process efficiency.

According to Hoyle (2007) an organization applying the process approach principle would be one in which people are:

- *Establishing what it is they want to do – what objectives they want to achieve or what outputs they want to deliver.*
- *Establishing measures of success – the factors that will indicate whether the objectives have been achieved or the outputs meet requirements.*
- *Defining the activities that are critical to achieving these objectives and delivering these outputs.*
- *Identifying the interfaces between the process and the functions of the organization the external customers, suppliers and other stakeholders.*
- *Establishing clear responsibility, authority, and accountability for managing the process.*
- *Defining the resources, information and competences required to deliver the required outputs.*
- *Identifying and measuring the inputs and outputs of the process.*
- *Identifying the risks and putting in place measures that eliminate, reduce or control these risks.*
- *Taking action to eliminate the cause of nonconforming inputs or outputs.*
- *Taking action to prevent use or delivery of nonconforming inputs or outputs until remedial action has been effected.*
- *Determining how performance will be measured against the objectives and reducing variation.*
- *Finding better ways of achieving the process objectives and improving process efficiency.*
- *Establishing whether the processes objectives remain relevant to the needs of the stakeholders and if necessary changing them.*

**System approach to management**

*Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and efficiency in achieving its objectives* (International Organization for Standardization).

Having a system approach means identifying and managing interrelated processes that aim at achieving the organization's objective. This approach should help structuring a system of interrelated

processes that efficiently seeks a defined objective. In line with system approach Zairi (1997) stresses the need to associate quality efforts to a larger sense of corporate purpose. Hoyle (2007) defines taking a systems approach to management as *managing the organization as a system of processes so that all the processes fit together, the inputs and outputs are connected, resources feed the processes, performance is monitored and sensors transmit information which cause changes in performance and all parts work together to achieve the organization's objectives.* He emphasizes the importance of the processes that work well within a system that has an objective. He explains that if one process works very well the whole system does not necessarily works very well if the processes are not in accordance to each other. *It is the interaction between processes, and not the actions of any single part or process that determines how well a system performs* (Ibid).

According to Hoyle (2007) an organization applying the system approach principle would be one in which people are:

- *Defining the system by identifying or developing the processes that affect a given objective.*
- *Structuring the system to achieve the objective in the most efficient way.*
- *Understanding the interdependencies among the processes of the system.*
- *Taking into account the needs of all stakeholders when making decisions or taking action.*
- *Understanding the impact of their actions and decision on the organization's goals and the processes that deliver outputs that are intended to satisfy these goals.*
- *Establishing resource constraints prior to action.*

**Continual improvement**

*Continual improvement of the organization's overall performance should be a permanent objective of the organization* (International Organization for Standardization).

Continuously improving processes and products is an essential element of quality management. Every individual needs to apply this principle in its day to day work. Continual improvement is about improving efficiency and improving effectiveness and people need to be trained on the relevant frameworks such as PDCA that helps to systematically set goals for improvement and improve accordingly. Hoyle (2007) sees three key areas where improvement is necessary: performance, method and target. Continuous improvement in performance means that everyone should continuously attempt to improve its performance and seek ways to decrease variation. Continuous improvement of methods means continuously seeking ways that can help better do things and continuously improving target means to seek new targets constantly to enhance the organization's capability.

According to Hoyle (2007) an organization applying the continual improvement principles would be one in which people are:

- *Making continual improvement of products, processes and systems an objective for every individual in the organization.*

- *Applying the basic improvement concepts of incremental improvement and breakthrough improvement.*
- *Using periodic assessments against established criteria of excellence to identify areas for potential improvement.*
- *Continually improving the efficiency and effectiveness of all processes.*
- *Promoting prevention-based activities.*
- *Providing every member of the organization with appropriate education and training, on the methods and tools of continual improvement.*
- *Establishing measures and goals to guide and track improvements.*
- *Recognizing improvements.*

**Factual approach to decision making**

*Effective decisions are based on the analysis of data and information* (International Organization for Standardization).

For taking decisions we need correct information therefore it is important to collect real data and measurements and analyze them. We need also suitable methods for collecting and analyzing the data. *The factual approach leads us to control activities based on fact rather than opinion or emotion* (Hoyle, 2007). We need to make sure about quality of data and use effective data collection methods. Hoyle (2007) argues about the importance of collecting information based on the needs and not only for the sake of having data that once can be used. He suggests going backward from the decision that one should take to the required information and not the other way around, this way the data collection has a purpose.

According to Hoyle (2007) an organization applying the factual approach principle would be one in which people are:

- *Taking measurements and collecting data and information relevant to the objective.*
- *Ensuring the data and information are sufficiently accurate, reliable and accessible.*
- *Analyzing the data and information using valid methods.*
- *Understanding the value of appropriate statistical techniques.*
- *Making decisions and taking action based on the results of logical analysis balanced with experience and intuition.*

**Mutually beneficial supplier relationships**

*An organization and its suppliers are interdependent and a mutually beneficial relationship enhances the ability of both to create value* (International Organization for Standardization).

According to Hoyle (2007) an organization applying the supplier relationship principle would be one in which people are:

- *Identifying and selecting key suppliers on the basis of their ability to meet requirements without compromising quality.*

- *Establishing supplier relationships that balance short-term gains with long-term considerations for the organization and society at large.*
- *Creating clear and open communications.*
- *Initiating joint development and improvement of products and processes.*
- *Jointly establishing a clear understanding of customers' needs.*
- *Sharing information and future plans.*
- *Recognizing supplier improvements and achievements*

## 3.4 ISO 9000 and 9001

According to International Organization for Standardization *ISO 9000 family addresses various aspects of quality management and contains some of ISO's best known standards. The standards provide guidance and tools for companies and organizations who want to ensure that their products and services consistently meet customer's requirements, and that quality is consistently improved. There are many standards in the ISO 9000 family, including:*

- *ISO 9001:2008 – sets out the requirements of a quality management system.*
- *ISO 9000:2005 – covers the basic concepts and language*
- *ISO 9004:2009 – focuses on how to make a quality management system more efficient and effective*

As stated previously ISO 9001 sets out the requirements of a quality management system. It can be used by any organization regardless of its size and field of activities. ISO 9001 was first published in 1987. Next versions were published in 1994, 2000 and 2008.

### 3.4. 1 Evolution of ISO 9001

Many authors criticized ISO 9001 because of the limitations of the 1987 and 1994 versions of the standard (e.g. Avery, 1994; Brown, 1994; Reedy, 1994). They point to the extensive documentation required and lack of focus on customer satisfaction and continuous improvement. These limitations in 1987 and 1994 versions developed a negative idea about the standard between researchers and practitioners.

However, the 2000 version of ISO 9001 significantly changed compared to the previous version. The new standard placed more emphasis on customers. Although the 1994 version was also oriented to meeting customer needs, the 2000 version addressed meeting customer requirements and satisfaction more in details and with more emphasis. Another area that was modified in 2000 version was continuous improvement. Continuous improvement was implicitly required in 1994 version but the new standard demanded organizations explicitly to make improvements. Moreover, the amount of documentation required decreased in the new version.

The 2000 versions placed emphasis on a process approach to quality management as well. ISO 9000:2005 defines the process approach as *the systematic identification and management of the processes employed within an organization and particularly the interactions between such processes*. This standard states that system approach to management and Identifying, understanding and managing interrelated processes as a system contributes to the organization's effectiveness and

efficiency in achieving its objectives. As explicitly stated in the standard the intent of ISO 9001 is to encourage the adoption of the process approach to manage an organization.

The standard suggests that organizations have to identify and manage numerous interrelated and interacting processes in order to operate effectively. Figure 4 illustrates the process-based quality management system described in the ISO 9000 family of standards.

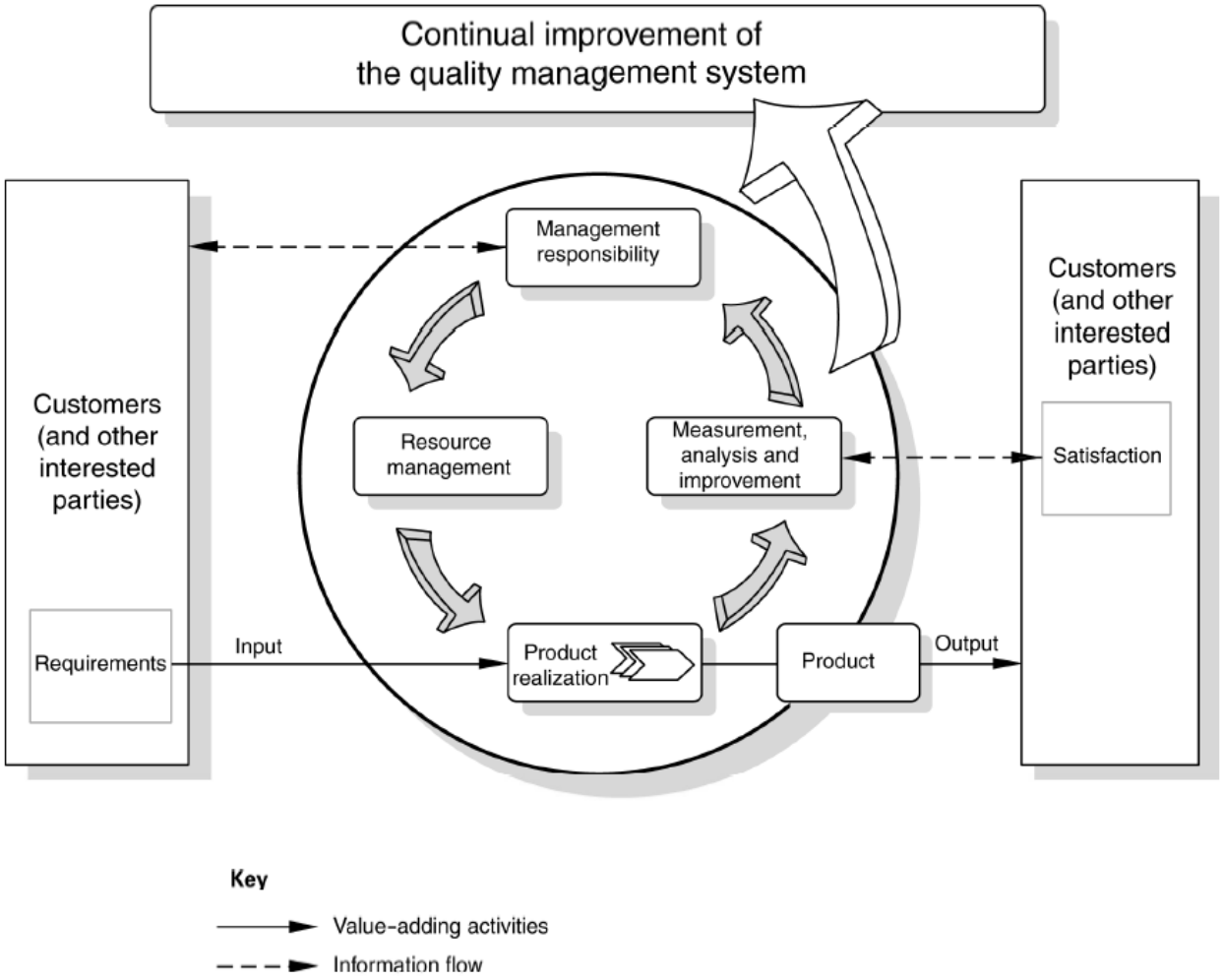


**Figure 3: Model of a process-based quality management system**

The 2008 version of ISO 9001 standard uses the same structure as of the 2000 version and the content of the standard is very similar to the last version. There are only some clarifications and modifications. The process approach to quality management system remains as the important approach of the standard.

### 3.4.2 ISO 9001 requirements

ISO 9001 is based on the eight quality management principles that were previously explained. All the requirements of ISO 9001 are related to one or more of these principles. These principles provide the reasons for the requirements. There are 8 sections in ISO 9001:2008:

1. Scope
2. Normative references
3. Terms and definitions
4. Quality management system
5. Management responsibility
6. Resource management
7. Product realization
8. Measurement, analysis and improvement

Sections from 5 to 8 contain requirements that are based on quality management principles.

**Management responsibility**
5.1 Management commitment
5.2 Customer focus
5.3 Quality policy
5.4 Planning
5.4.1 Quality objectives
5.4.2 Quality management system planning
5.5 Responsibility, authority and communication
5.5.1 Responsibility and authority
5.5.2 Management representative
5.5.3 Internal communication
5.6 Management review
5.6.1 General
5.6.2 Review input
5.6.3 Review output

**Management responsibility** – This section contains requirements directly assigned to top management. It requires top management to be responsible for quality management system and to define the quality objectives and the quality policy in order to achieve customer satisfaction. They must assign responsibility to people in the organization and communicate about this and regarding the effectiveness of the quality management system. Top management should also review the quality management system to ensure its effectiveness.

**Resource management**
6.1 Provision of resources
6.2 Human resources
6.2.1 General
6.2.2 Competence, training and awareness
6.3 Infrastructure
6.4 Work environment

**Resource management** – Top management should ensure provision of appropriate resources for implementing quality management system. These resources include trained, competent human resources, infrastructure and suitable work environment such as an office with good lighting and temperature.

**Product realization**
7.1 Planning of product realization
7.2 Customer-related processes
7.2.1 Determination of requirements related to the product
7.2.2 Review of requirements related to the product
7.2.3 Customer communication
7.3 Design and development
7.3.1 Design and development planning
7.3.2 Design and development inputs
7.3.3 Design and development outputs
7.3.4 Design and development review
7.3.5 Design and development verification
7.3.6 Design and development validation
7.3.7 Control of design and development changes
7.4 Purchasing
7.4.1 Purchasing process
7.4.2 Purchasing information
7.4.3 Verification of purchased product
7.5 Production and service provision
7.5.1 Control of production and service provision
7.5.2 Validation of processes for production and service provision
7.5.3 Identification and traceability
7.5.4 Customer property
7.5.5 Preservation of product
7.6 Control of measuring and monitoring equipment

**Product realization** – This section sets the requirements for realizing a product. It requires planning, design and development, purchasing and production efforts that are needed for delivering a product based on customer requirements.

**Measurement, analysis and improvement**
8.1 General
8.2 Monitoring and measurement
8.2.1 Customer satisfaction
8.2.2 Internal audit
8.2.3 Monitoring and measurement of processes
8.2.4 Monitoring and measurement of product
8.3 Control of nonconforming product
8.4 Analysis of data
8.5 Improvement
8.5.1 Continual improvement
8.5.2 Corrective action
8.5.3 Preventive action

**Measurement, analysis and improvement** – This section requires monitoring and measuring the performance of the quality management system and also customer satisfaction through auditing the organization. It also requires the organization to continually improve the quality management system and to put in place corrective and preventive actions when things go wrong.

### 3.4.3 Risks and limitations of ISO 9001

The marketing motivation of the ISO 9001 has been discussed by several researchers and practitioners. Rayner and Porter (1991) and Curkovic and Pagell (1999) argue that without the goal of certification and marketing benefits, many firms would never complete the aim of an effective quality assurance system. Although there are many benefits to achieve from ISO 9001 implementation only a few companies that aim to go further than certification can achieve them. The implementation strategy and the way management view ISO 9001 very much affect the success of ISO 9001 implementation (Biazzo and Bernardi, 2003; Hoyle, 2007; Lee et al., 1999). Biazzo and Bernardi (2003) discuss that ISO 9001 can be effective in adopting TQM principles only if the aim is not to obtain certificate but with the aim to exploit the potentials of the standard. *Companies can really benefit from the process if they see the standards as an opportunity to organize and improve their internal operations and quality, by creating a dynamic and ever-improving quality system that may evolve in a TQM system* (Gotzamani and Tsiotras, 2001).

As discussed by Biazzo and Bernardi (2003) ISO 9001 brings many benefits for organizations but also it brings some risks with it when companies consider the standard only as a mean for achieving the certificate. These risks include:

**Ritualistic implementation** - Biazzo and Bernardi (2003) refer to ritualistic implementation of ISO as a risk that can be seen in many organizations. They use ritualistic implementation to refer to *the adoption of external norms targeted at social legitimation, which can very likely lead to a separation between the real functioning of the firm's processes and the documented procedures of the quality system.* They provide examples of companies that produce polished documentation and objective evidence that fulfill normative requirements. This risk was also discussed in the theoretical framework earlier. Several documentation structures (ISO-related and practical ones) with the lack of accordance between them will prevent the structures to be integrated to tacit guiding structure.

**Auditors' interpretation of ISO** - Hoyle (2007) discusses the problems emerging from the way internal and external auditors perform the audits. Particularly the questions that auditors ask during the course of interviews very much influence on people perception about ISO 9001. Asking questions that are irrelevant to the business of the company or are very much focused on the documentation

leaves narrow interest for ISO among people. Consistent with this point Martínez-Costa and Martínez-Lorente (2007) state that *If the registration body interprets the new version of the standard in a way close to TQM, then companies will be forced to apply it this way and perhaps it will help management attain higher levels of performance.*

**Conformance nature of the standard** - Another risk associated with ISO 9001 is regarding the conformance nature of the standard. Many authors discuss that implementing the standard with the aim of certification make companies focus on achieving compliancy (e.g. Beattie and Sohal, 1999; Biazzo and Bernardi, 2003; Hoyle, 2007). From the certification point of view satisfying a specific level of requirements will be sufficient. *The company does not have to aim for excellence* (Lee et al, 1999). Biazzo and Bernardi (2003) provide the example of when in an ISO-certified company they researched there was no structured translation of organizational performance indicators into process performance measures, which is a crucial step in process management.

**Fails to cause radical improvements** - One of the limitations of ISO 9001 discussed in the literature is that it fails to cause radical improvements (Pritchard and Armistead, 1999; Biazzo and Bernardi, 2003). It cannot encourage large scale improvements because its scope usually stays in the operational level and it causes incremental improvements. ISO is not usually linked to the high level strategic objective of the company and this prevents end to end process improvements (Ibid and Lee et al., 1999; Reimann and Hertz, 1996).

**Company performance and efficiency** - In the literature there is no consensus on the effect of ISO 9001 on performance of the company. Some authors reported no significant difference between the ISO-certified and not certified companies in this regard (e.g. Shams-ur, 2001; Beattie and Sohal, 1999; Martinez-Costa et al., 2009). *Whatever its version is, ISO standard is not a guarantee of quality or better performance* (Martinez-Costa et al., 2009). Focusing on achieving the compliance and failing to make radical improvements are among the reasons that avoid ISO implementation resulting in superior performance results. It is also discussed by Al-Najjar and Jawad (2011) that ISO 9001 is a quality management system which is required by customers or countries and it does not guarantee successful competition. Also, some authors believe that the standard cannot guarantee efficiency, since the processes are not necessarily evaluated for their efficiency before they get documented (Biazzo and Bernardi, 2003; Al-Najjar and Jawad, 2011).

### 3.4.4 Benefits of ISO 9001

**Clarity on the job** – ISO makes the job clearer by defining the roles and responsibilities. Gotzamani and Tsiotras (2001) believe that quality assurance systems help companies to clear out ambiguities and clearly defining duties and responsibilities among employees and departments.

**Process work and better communication** – The results of many researchers show that ISO 9001 brings better process documentation and understanding and accordingly enhanced internal communication in the organization (e.g. Lee et al., 1999; Gotzamani and Tsiotras, 2001; Zhu and Scheuermann, 1999). *The documentation exercise enables a company to open internal lines of communication and review and alter current processes* (Zhu and Scheuermann, 1999). ISO also facilitates process improvement. As Lee and dale (1998) argue *process description, understand the*

*process and define key cross-functional business processes are essential steps in BPM. Without comprehensive definition and flowcharting it is not possible to move on to the next stage of breakthrough and continuous improvement.*

**Increased quality mindset** – *ISO proved that it boosts quality culture* (Gotzamani and Tsiotras, 2001). ISO brings quality awareness among employees and it encourages continuous improvement s through audits (Lee et al., 1999; Zhu and Scheuermann, 1999).

## 3.5 ISO 9001 and Total Quality Management

As previously mentioned ISO 9001 requirements are based on TQM principles. However as discussed by many authors regardless of its version, ISO 9001 standard cannot be considered as equal to Total Quality Management (e.g. McAdam and Jackson, 2002; Rayner & Porter, 1991; Beattie and Sohal, 1999; Curkovic and Pagell, 1999; Curkovic and Handfield, 1996) and ISO 9000-certified companies failed to implement a comprehensive TQM program (Gotzamani and Tsiotras, 2001; Lee et al., 1999; Reimann and Hertz, 1996; Martinez-Costa et al., 2009). Many researchers argue that ISO 9001 is a good foundation for achieving total quality (e.g. McAdam and Jackson, 2002; Hill et al., 2001; Beattie and Sohal, 1999; Curkovic and Pagell, 1999; Mann and Voss, 2000). They believe that ISO should be viewed as a step toward TQM and not the TQM itself. McAdam and Jackson (2002) discuss that having ISO implemented is an advantage for TQM and TQM is considered to be best implemented within the controlled environment of ISO 9000.

### 3.5.1 Contribution of ISO 9001 to TQM principles

Studying ISO 9001 standard will give us an idea about how ISO contributes to TQM principles. The following table shows the result of evaluating this contribution. It was developed by author and a Business Administration student which is knowledgeable in Quality Management area. At first the evaluation was done individually and then the result was compared. The result of the both evaluations was very similar and the differences were discussed in a brainstorming session and consensus achieved. There are a couple of researches investigating the amount of ISO 9001 contribution to TQM principles (Lee at al., 1999; Gotzamani and Tsiotras, 2001; Martinez-Costa et al., 2009; Reimann and Hertz, 1996; Martinez-Lorente and Martinez-Costa, 2004; Martínez-Costa and Martínez-Lorente, 2007; Rao et al., 1997) and the result of this evaluation is supported by literature as will be discussed during the presentation of the evaluation. “D” indicates direct contribution, “I” indicates indirect contribution and blank cells indicate no contribution. If there is no direct contribution from ISO requirements to TQM categories then the contribution score is considered low and if there are more than two direct contributions the score is considered to be high. If there are two or one direct contributions then contribution score is considered to be medium.

| | TQM Principles | Customer focus | Leadership | Involvement of people | Process approach | System approach to management | Continual improvement | Factual approach to decision making | Mutually beneficial supplier relationships |
|---|---|---|---|---|---|---|---|---|---|
| ISO 9001 Requirements | Management Responsibility | D | D | I | I | I | D | I | |
| | Resource Management | I | I | I | I | | D | | |
| | Product Realization | D | I | I | D | I | I | D | I |
| | Measurement, Analysis and Improvement | D | I | I | D | | D | D | I |

D = Direct I= Indirect

D=0 --> low contribution D>2 --> high contribution D=1 or 2 --> medium contribution

**Table 2: Contribution of ISO 9001 to TQM principles**

As you can see in the table the scores for "customer focus" and "continual improvement" are high. "Involvement of people", "system approach to management" and "mutually beneficial supplier relationships" have low scores. "Leadership", "process approach" and, "factual approach to decision making" have medium scores.

The evaluation was based on considering how much each of the TQM principles was repeated in same wording or subjectively in the ISO requirements. For example the principle "customer focus" appeared several times in different requirements directly or indirectly.

"**Customer focus**" is directly mentioned in "management responsibility", "product realization" and "measurement, analysis and improvement" clauses of the standard. "**Continual improvement**" is directly mentioned in "management responsibility", "resource management" and "measurement, analysis and improvement". Gotzamani and Tsiotras (2001) and, Martínez-Costa and Martínez-Lorente (2007) researched the contribution of ISO 9001 and they also arrived at the conclusion that the standard contribution in "customer focus" category is very significant. Martínez-Costa and Martínez-Lorente (2007) and, McAdam and Jackson (2002) researches also support that the contribution of the standard on "continual improvement" of company's processes is high. *ISO may be utilized as a vehicle to promote continuous improvement (*McAdam and Jackson, 2002).

In the standard "**involvement of people**" is only referred to indirectly and partly. The area of reference is only about the training requirements. The researches of a number of authors such as Gotzamani and Tsiotras (2001), Reimann and Hertz (1996), Martinez-Lorente and Martinez-Costa (2004) and, McAdam and Jackson (2002) supports the evaluation result about "involvement of people". They argue that the standard addresses human resource issues that are related to training requirement such as procedures for identifying training needs, qualifications of personnel performing tasks, and maintenance of appropriate records of training. Other human resource issues that are very important for TQM such as training in quality related issues, development of employee participation programs and incentive programs for quality improvement are not addressed. *Thus, human resource management constitutes the most challenging and demanding category for those companies that*

*want to proceed to TQM* (Gotzamani and Tsiotras, 2001). Reimann and Hertz (1996) that compared Malcolm Baldrige Award and ISO 9000 argue that the Baldrige Award has developed far more requirements for people involvement compared to ISO 9000.

The standard has not addressed "**system approach to management**" directly; the evaluation shows that it is only addressed indirectly in "management responsibility" and "product realization" clauses of the standard. As explained earlier system approach means identifying and managing interrelated processes that aim at achieving the organization's objective such as business results. As mentioned the standard requires identification and management of interrelated processes but it does not necessarily encourage the end to end process approach as a process management program such as BPM would encourage (Biazzo and Bernardi, 2003). Lee et al. (1999); Reimann and Hertz (1996) and Biazzo and Bernardi (2003) also discuss that ISO 9001 is not tied to business decisions and strategy and does not address the business results. *The weakest aspect of ISO 9000 is that it places no emphasis on business results* (Lee et al., 1999). However as stated in ISO 9000:2005, *the quality management system is that part of the organization's management system that focuses on the achievement of results, in relation to the quality objectives, to satisfy the needs, expectations and requirements of interested parties, as appropriate. The quality objectives complement other objectives of the organization such as those related to growth, funding, profitability, the environment and occupational health and safety. The various parts of an organization's management system might be integrated, together with the quality management system, into a single management system using common elements*. As we can see the standard excludes the focus on those types of objectives such as growth and profitability and it encourages integrating ISO with other programs that address these types of objectives.

"**Mutually beneficial supplier relationships**" is only addressed indirectly and partly in "product realization" and "measurement, analysis and improvement" clauses of the standard. Although one of the goals of ISO 9001 was to create closer relationship between the supplier and customer however we can still see the distance between them in ISO-certified companies. The standard requires the conformance of the supplier products to the requirements but does not encourage mutually beneficial relationships with suppliers. Martínez-Costa and Martínez-Lorente, 2007; Gotzamani and Tsiotras, 2001 and; Martinez-Lorente and Martinez-Costa, 2004 discuss the limitation of ISO 9001 in contribution to this category of TQM. *ISO 9000 may force companies to make controls on products received from suppliers when TQM upholds the suppression of controls and the set up of a relationship with suppliers based on mutual trust* (Martinez-Lorente and Martinez-Costa, 2004).

"**Leadership**" is addressed directly in "management responsibility" and indirectly in "resource management", "product realization" and "measurement, analysis and improvement" clauses of the standard. ISO 9001 requires assignment of a member of top management to be responsible for quality management. The standard also needs review, control and improvement of the quality management system from the top management. Martínez-Costa and Martínez-Lorente (2007) report that the majority of the companies they researched are pessimistic about the ability of ISO 9001 to encourage leadership. However, as stated earlier the managers' commitment very much depends on their motivation of implementing ISO and the implementation strategy they choose. If the aim is to

get certification then managers might only commit to quality in the quality policy document to pass the audits. If managers start an ISO program to use it as a framework to satisfy customers and to exploit the potentials of ISO then "leadership" category of the TQM is very much addressed.

In the standard "**process approach**" was directly referred to in the clauses "product realization" and "measurement, analysis and improvement ". Gotzamani and Tsiotras (2001) report that in the companies they researched process management improved after the standard certification *mainly through systematic documentation and control of critical processes and products quality, which provides a solid basis for future improvement.* ISO has been successful in creating a mind set about process documentation, understanding the inputs and outputs of a process and developing process measures. On the other hand Biazzo and Bernardi (2003) and, Pritchard and Armistead (1999) have negative idea about the ISO contribution to process management. Biazzo and Bernardi (2003) investigation on the process management practices in ISO 9001 shows that although the new ISO 9001 is based on the process approach to quality management and encourages organizations to adopt process approach, many organizations applying ISO 9001 have not been successful in process management. They do not assign time and resources to important tasks required for effective process management such as process ownership and performance management based on end to end processes. ISO 9001 has not been able to encourage high level of commitment to process management (Biazzo and Bernardi, 2003). As discussed by Zairi (1997) accredited quality assurance systems like ISO 9001 have provided benefits for many organizations. However, they are not enough for developing a culture of process management; they are a good foundation for deploying a holistic Process Management system.

"**Factual approach to decision making**" is addressed indirectly in "management responsibility" and directly in "product realization" and "measurement, analysis and improvement" clauses of the standard. This is almost a good contribution however McAdam and Jackson (2002) research shows that ISO has limited impact on performance measurement requirement of TQM.

From this evaluation it can be concluded that soft requirements of TQM i.e. "leadership", "involvement of people", "system approach to management" and "mutually beneficial supplier relationships" are not well addressed in ISO 9001 requirements. This might be because of the difficulty to set requirements for intangible, soft categories of TQM. Gotzamani and Tsiotras (2001) believe that the companies' efforts after certification should focus on the soft elements of TQM which proved to be the ones with the lowest performance improvement from certification. *Improvements in these elements are particularly important, since there is adequate research proving that business performance is more heavily influenced by the "soft" elements of TQM rather than the "hard" ones* (Ibid).

The following table summarizes the contribution of ISO 9001 to TQM principles:

| TQM principles | ISO 9001 |
|---|---|
| Customer focus | HC |
| Leadership | MC |
| Involvement of people | LC |
| Process approach | MC |
| System approach to management | LC |
| Continual improvement | HC |
| Factual approach to decision making | MC |
| Mutually beneficial supplier relationships | LC |

**LC=Low Contribution HC=High Contribution MD=Medium Contribution**

**Table 3: Contribution of ISO 9001 to TQM principles, summary**

## 3.6 Business Process Management and Total Quality Management

Researches of Elzinga et al. (1995) and, Biazzo and Bernardi (2003) show that business process management is part of a comprehensive quality management program. However, there is no research that evaluates the contribution of BPM to TQM principles. In BPM literature there are only ideas of authors sporadically about contribution of BPM to some of the TQM principles that can be used for this research. For example in those literatures we have:

- Hung (2006) defines BPM principles as: holistic view, strategic imperative, enabled by information technology, corporate-wide impact, emphasizes cross-functional process management. This can support the idea that BPM has good contribution to "system approach to management", "Involvement of people", "Leadership" and "process approach". The reason that it has good contribution to "Involvement of people" and "Leadership" is that as Hung (2006) explains BPM has corporate-wide impact and influences the way managers manage and it requires employees to be actively involved in acquiring the process-based results.
- Many authors as was discussed before argue that performance measurement is a critical principle in BPM (e.g. Armistead and Machin, 1997; Hung, 2006; Balzarova et al., 2004; Armistead et al., 1999; Melan, 1989).

According to these and several other literatures that will be referred to, the contribution of BPM to TQM principles will be discussed in the following. Three categories of contribution will be used: high contribution, medium contribution and low contribution. The selection between these categories depends on how literature has addressed the importance of the principle in BPM.

**Customer focus –** Zairi (1997), Hung (2006), Ittner and Larcker (1997) and, Lee and Dale (1998) argue that BPM through process orientation attempts to improve customer focus by avoiding the limitations of managing by vertical functions. Although BPM creates value for stakeholders including customers this principle of TQM is not directly addressed in BPM. As we can see authors believe that through horizontal management of the processes, customer orientation will be improved. Nowhere in BPM literature we can see that BPM emphasizes focus on customers; it is more oriented

to achieving organizational objectives through process management. Therefore, it can be concluded that the contribution of BPM to "customer focus" principle of TQM is medium.

**Process approach** – Process approach is at the heart of BPM principles. This is discussed extensively in BPM literature (Elzinga et al., 1995; Zairi, 1997; Hung, 2006; Ittner and Larcker, 1997; Lee and Dale, 1998; Pritchard and Armistead, 1999; Armistead and Machin, 1997; Benner and Tushman, 2003, Armistead et al., 1999; Armistead, 1996; Balzarova et al., 2004). Identification, improvement, management and control of processes of the organization are essential in BPM. Particularly cross-functional and critical processes that usually pass through different functions need to be properly managed. As previously seen BPM provides detailed guidelines and extensive help for applying this principle of TQM. Therefore we can conclude that the contribution of BPM to this principle of TQM is high.

**System approach to management** – Identifying, understanding and managing interrelated processes as a system is also at the heart of BPM principles. Hung (2006) believes that BPM and TQM have many similarities. He discusses that BPM provides a systematic and holistic thinking, as does TQM. *BPM takes a holistic view and attempts to overcome the piecemeal improvements in isolated parts of a business process that often result in sub-optimal solutions* (Hung 2006). Al-Mashari (2002) and Hung (2006) believe that BPM addresses the interdependence of strategy, people, processes and technology in achieving business objectives. Many authors such as Pritchard and Armistead (1999), and Lee and Dale (1998) believe that addressing the business results and delivering the strategic intent of the company is among important features of BPM. In their research, Pritchard and Armistead (1999) report that BPM increasingly is being used in a more holistic manner to manage all aspects of the business and not only as process improvement dimension. The holistic view of the BPM can be considered as a high contribution to the "system approach to management" principle of TQM.

**Continual improvement** – In BPM literature it is discussed that BPM is based on a continuous approach (e.g. Zairi, 1997; Lee and Dale, 1998; Elzinga et al., 1995; Pritchard and Armistead, 1999; Jeston and Nelis, 2008 and Harrington, 1995). Lee and Dale (1998) argue that performance of the processes should be monitored and opportunities for improvement should be looked for. They refer to PDCA as a framework for continual improvement. The importance of continual approach was also discussed in the BPM implementation method earlier. According to the literature in BPM the emphasis is on continually improve the critical processes and therefore the scope of continual improvement in BPM is narrower than the scope of continual improvement principle in TQM. TQM requires continual improvement of everything that someone does as part of her work. We can conclude that BPM has a medium contribution to this principle of TQM.

**Factual approach to decision making –** Collecting the correct data about processes, developing measures and analyzing them is critical for process improvement. Therefore this principle of TQM is of great importance for BPM. In BPM literature performance measurement, an important element in this principle has been extensively discussed. Many authors believe that performance measurement is a critical success factor for BPM; particularly developing and controlling measure at high strategic levels that should be cascaded down to operational measures (e.g. Armistead and Machin, 1997;

Hung, 2006; Balzarova et al., 2004; Armistead et al., 1999; Melan, 1989). We can conclude that BPM has high contribution to "Factual approach to decision making".

**Leadership** – According to literature top management commitment is one of the success factors of BPM; BPM approach and its activities require management support (Hung, 2006; Elzinga et al., 1995; Harrington, 1995). It is difficult to evaluate the contribution of BPM to "leadership" principle of TQM. This principle of TQM requires many features of management that a program such as BPM which mainly focuses on achieving organizational objectives through process management might not be able to deliver all of them. The literature only discusses the importance of management commitment in a BPM program but does not discuss how BPM contributes to this principle of TQM. What seems to be reasonable is that if a program is considered to be a corporate-wide program it can attract many efforts and full management support and it can be expanded to a comprehensive management program. Therefore, we can conclude that BPM have a medium contribution to "leadership" principle of TQM and in some cases if it is considered as a holistic, corporate-wide program it can highly contribute to this principle.

**Involvement of people** – Human resource practices such as training, developing employee involvement programs, developing reward systems based on contribution to process improvements are critical for BPM (Ittner and Larcker, 1997; Balzarova et al., 2004; Armistead, 1999; Elzinga et al., 1995; Hung, 2006; Rosemann et al., 2004). BPM has a corporate-wide impact (Hung 2006) and requires people involvement for effective process management. Evaluating the amount of BPM contribution to "involvement of people" principle of TQM is not straightforward as we lack researches that address this issue. However, it is reasonable that if a program is considered to be a corporate-wide program and systematically changes the culture of the organization in line with quality management requirements then involvement of people can be guaranteed. It highly depends on management view and the change management practices; if managers encourage process management and act as role models then people will be process-minded. Therefore, we can conclude that BPM have a medium contribution to "involvement of people" principle of TQM and in some cases if it is considered as a holistic, corporate-wide program it can highly contribute to this principle.

**Mutually beneficial supplier relationships** – This principle of TQM has not been addressed in BPM literature. Therefore it is not easy to evaluate the BPM contribution to this principle of TQM.

As was discussed before several authors believe that IT is an important element in BPM and BPM implementation should be accompanied with IT. Therefore it can be concluded that compared to TQM, the use of IT is highlighted and is more predominant in BPM. Hung (2006) also believes that IT is a principle of BPM.

As we can see BPM can partly contribute to TQM through some principles. The major contribution is through "process approach", "system approach to management" and "factual approach to decision making". However, Armistead and Machin (1997) in their research of companies excellent in BPM found that these companies believe the real value derived from the process approach is through the understanding and development of an approach at higher levels within the organizations, rather than

simply process improvement activity at the task or team level. Moreover, Pritchard and Armistead (1999) believe that the use of BPM at the strategic level is one of the most significant aspects of BPM. Therefore connecting BPM efforts to strategic objectives of the company is important and highlighted in BPM literature. *BPM is intended to align the business processes with strategic objectives and customers' needs* (Lee and Dale, 1998).

Elzinga et al. (1995) believe that *BPM is the method by which TQM is carried out* but this is not a general idea in the literature because as was mentioned BPM can partly contribute to TQM principles. It seems that a complementary program would be suitable to progress toward TQM.

## 3.7 ISO 9001 and BPM

In previous chapters we saw that neither ISO 9001 nor BPM completely contributes to TQM. As a result of their research, Beattie and Sohal (1999) found that majority of the companies they researched execute a quality program together with ISO. This result is also in line with Hayes (1994) results. According to previous analysis the following table shows the amount of contribution to TQM principles by ISO and BPM:

| TQM principles | ISO 9001 | BPM |
|---|---|---|
| Customer focus | HC | MC |
| Leadership | MC | M/HC |
| Involvement of people | LC | M/HC |
| Process approach | MC | HC |
| System approach to management | LC | HC |
| Continual improvement | HC | MC |
| Factual approach to decision making | MC | HC |
| Mutually beneficial supplier relationships | LC | - |

**LC=Low Contribution HC=High Contribution MD=Medium Contribution -=difficult to analyze**

**Table 4: Contribution of ISO 9001 and BPM to TQM principles**

Pritchard and Armistead (1999) report that several companies use ISO 9001 in a supportive manner together with their process management program because ISO brings clarity and specifies the" what" rather than "how". The literature does not provide guidance on how ISO 9001 and BPM can be applied together but what is clear and emphasized in the literature is that ISO 9001 sets the requirements and there is a need to complement it with another quality program (e.g. Biazzo and Bernardi, 2003; Pritchard and Armistead, 1999; Beattie and Sohal, 1999; Gotzamani and Tsiotras, 2001; Martinez-Lorente and Martinez-Costa, 2004). *Following standards requirements alone will not be enough to guarantee sustained competitive advantages* (Gotzamani and Tsiotras, 2001). From these literature together with the discussions in previous chapters it is reasonable to conclude that ISO 9001 and BPM can be applied together in order to progress toward TQM.

# 4 Company presentation

In section 4.1 a general overview about Amadeus in which this research was conducted will be presented. The quality work and the information about the BPM initiative in Amadeus will be presented in section 4.2 and 4.3 respectively.

## 4.1 Overview

Amadeus was created in 1987 as the result of a joint agreement between four of the largest European airlines. Air France, Iberia, Lufthansa and SAS decided to merge their individual computer reservation systems to create a new Global Distribution System (GDS).

Amadeus is a leading transaction processor for the global travel and tourism industry, providing transaction processing power and technology solutions to both travel providers (including full service carriers and low-cost airlines, hotels, rail operators, cruise and ferry operators, car rental companies and tour operators) and travel agencies (both online and offline). Amadeus business structure can be seen in Figure 5. The company acts both as a worldwide network connecting travel providers and travel agencies through a processing platform for the distribution of travel products and services, and as a provider of a comprehensive portfolio of IT solutions which automate certain mission-critical business processes, such as reservations, inventory management and operations for travel providers.

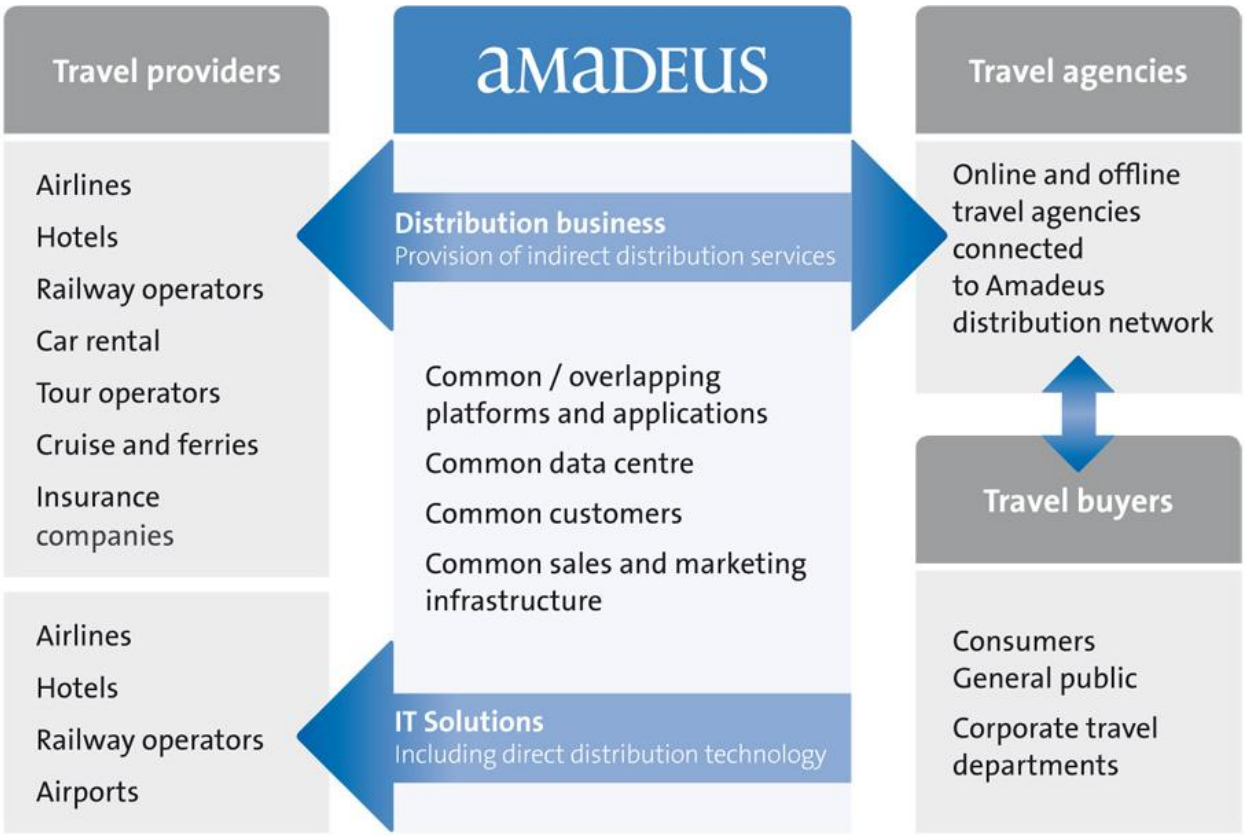


**Figure 4: Amadeus business structure**

Amadeus operates under a transaction-based business model that offers IT solutions to virtually all players in the travel industry. This allows travel companies to convert certain of their fixed IT and distribution costs into variable costs that fluctuate broadly in line with traveler volumes. Amadeus' distribution and IT solutions have been designed to facilitate all of the key stages of domestic and international travel and include technologies that cover itinerary planning, fare-searching, reservations, ticketing, airlines schedule and inventory control, passenger check-in and departure control and certain post-travel solutions.

## 4.2 Quality work in Amadeus

Amadeus quality management system has been developed to support the mission of the company. According to Amadeus Quality Policy:

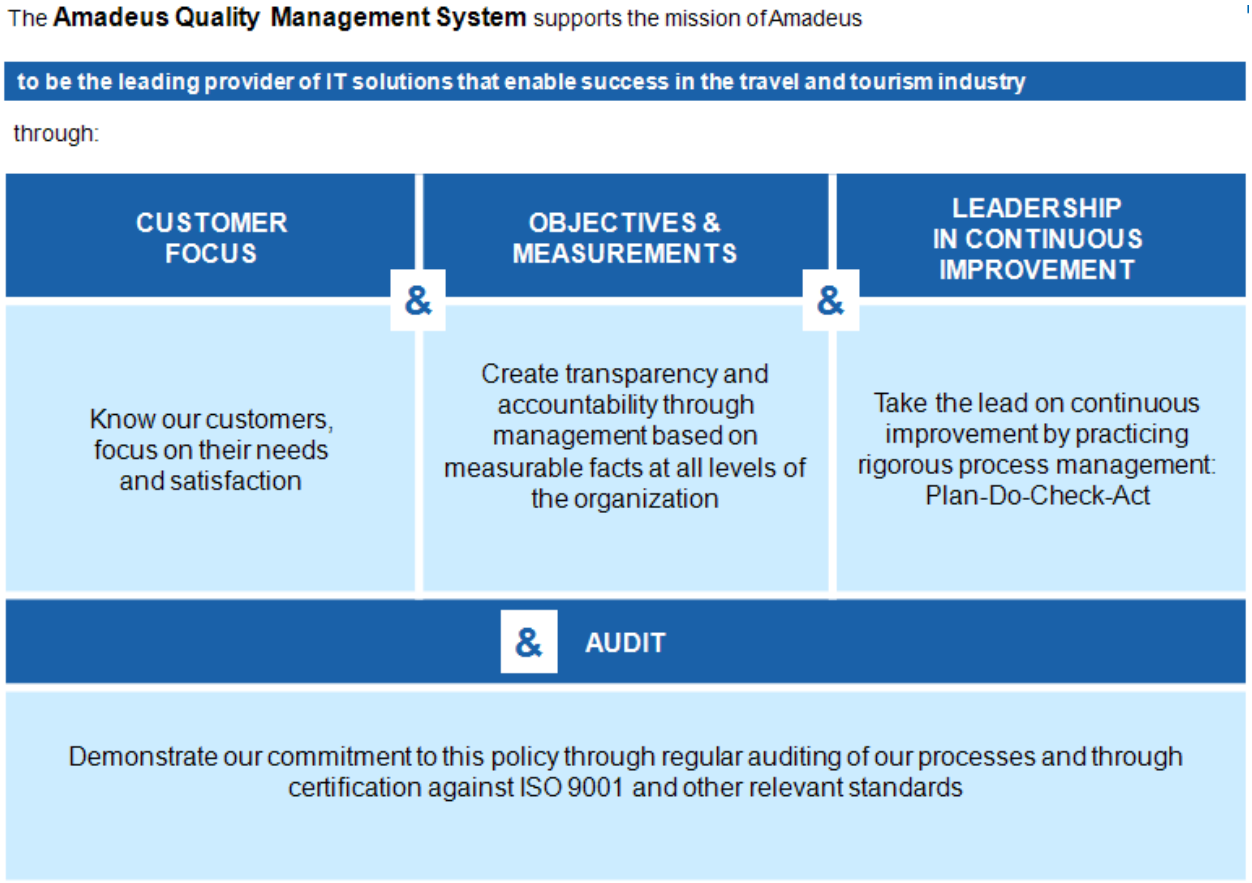


**Figure 5: Amadeus Quality Policy**

From this policy it is understood that the emphasis in Amadeus quality management system is on three principles of quality management: “customer focus”, “factual approach to decision making” and “continual improvement”. ISO 9001 including internal and external audits acts as a framework for Amadeus quality management system that guides the quality work in the company and as mentioned demonstrates Amadeus commitment to quality policy.

According the Amadeus quality management system documents the reasons that Amadeus decided to become ISO 9001 certified are:

From the customer perspective

- This means that Amadeus is dedicated to improve customer satisfaction
- Provides guaranteed levels of performance
- Place continuous improvement at the forefront of what we do
- Commitment to the future

From the stakeholders perspective

- "management assurance" means a better, safer value investment
- A supplier with the right attitude for a sustaining partnership

A competitive advantage

- Continuing to lead the industry with international quality standards and to be the only GDS (Global Distribution System) ISO 9001:2008 certified.

The first certification against ISO 9001 was acquired in 1998. Amadeus marketing and development site located in Nice is among the Amadeus sites that is ISO 9001 certified. The Quality Management and Compliance team (QMC team) in Nice is consisted of the head of this team that is responsible for managing the team, a local quality manager and four internal ISO 9001 auditors. In late 2011 there was a reorganization and Business Process Management (BPM) team was formally shaped. QMC team is now a team inside BPM organization and is managed by head of BPM.

The Quality and Compliance Committee (QMC Committee) is a committee consisted of Amadeus top management and is a decision making organization that decides the strategy for QMC team including the resource allocation to quality work. The members of this committee are supposed to meet three to four times a year.

There is a network of Quality Coordinators (QCs) in Amadeus and the purpose for having these coordinators is to drive and coordinate quality management implementation & improvement activities and to ensure ISO 9001:2008 compliance within different departments. QCs dedicate around 10% of their working time to quality work in their department.

The activities of QMC team include:

**Trainings**

- KPI Training, dedicated to train QCs and other interested people on Key Performance Indicators. The objective of the training is to raise the awareness on importance of measurement, to understand when to apply a KPI methodology and to be able to identify and implement key measures.

- QC induction training dedicated to train QCs overall on quality management concepts, ISO 9001, quality organization in Amadeus etc. In this training QCs get familiar with their roles and responsibilities.
- Business Process Management. This training was previously named as "Running an Improvement Project" training. In this training trainees learn about DMAIC (Define, Measure, Analyze, Improve, Control) as an improvement methodology and the tools and techniques that are required in each phase of DMAIC. For example ARIS Express, a business process modeling tool is taught for being able to map the processes. People are also get informed about BPM work in Amadeus, its organization, roles and responsibilities and they are encouraged to seek improvement opportunities in their departments and if they need support and consultancy from BPM team contact them.
- Internal audit training that is aimed to train people about the requirements of ISO 9001, preparing an internal audit, conducting the audit, preparing the audit report and following up on audit results.

**Internal audit**

QMC team performs internal audits against ISO 9001 requirements and Amadeus specific requirements. The types of audits are different such as process audit that might passes through several departments, department audits, and project audits. In the internal audit auditors mainly determine the conformity or non-conformity of the department/process/project work with ISO 9001 and Amadeus requirements. They also look for best practices that can be shared with other teams. Each department will be internally audited once in a 3 year period therefore the whole Amadeus departments are audited in 3 years. During one of the external audits Amadeus received a non-conformity because of the lack of systematic internal audits. After that three headcounts were employed and professionally trained to work fully on internal audits. That non-conformity changed to a satisfactory area in the next external audit results.

After the reorganization and inclusion of QMC team in BPM organization, the BPM team leader decided that two of the internal auditors work partly on ISO 9001 internal audit and instead perform BPM activities. They were assigned to BPM projects and their role was defined as a BPM Manager.

**External audit**

QMC team performs all of the activities that are necessary to have a certification body and to have the external audits conducted. These activities include preparing and sending a request for proposal to several certification bodies, selecting the certification body under the supervision of QMC committee, guiding and accompanying external auditors during the audits.

At one point there was dissatisfaction with one of the external auditors that influenced the way that some managers in Amadeus think about ISO 9001. The questions that were asked during the interviews were not very much relevant to the business and this affected the peoples' impression about ISO 9001. QMC team changed the certification body after that.

**Excellence Awards**

Excellence Awards is an award program that is held once a year. Through an internal communication sent from QMC team people are invited to send their applications to QMC team for evaluation. The application is about an improvement project that the team has done. Its format is designed by the QMC team and asks people to follow DMAIC steps to explain their project. Based on some predefined criteria a number of winners are selected and awarded. This program is an important program in promoting the continuous improvement culture in the company. People understand that management recognizes the improvement work and they get familiar with the methodology for improvement (DMAIC) and they can use it for other improvement projects that they are involved in. Excellence Awards program is also a good platform for best practice sharing.

After the reorganization and management of the QMC team by BPM, Excellence Awards program was postponed in 2012 to another time.

**Quality Conference**

Quality Conference is a conference designed mostly for Quality Coordinators (QCs), other people can attend the conference if the logistical settings allow. The aim of the conference is to make QCs more familiar with the quality concept and the quality tools that they can use in their day to day work. QMC team organizes several workshops for this conference and the attendees get involved in the workshops. These workshops allow QCs to understand quality concepts or use tools practically and in an interesting way. Furthermore, there are usually external industrial or academic speakers that are invited to the conference and give speeches about quality in their organization or quality concept in general.

**Customer Complaints and Compliments management**

In early 2011 the management of customer complaints and compliments process was transferred to QMC team. The person responsible for this process handles the complaints or compliments that are received from customers. It means that she analyzes the issue and then transfers it to the responsible team to solve them problem. The process also requires an improvement in the area of the problem so that it will not occur again in the future. There have been some large improvement projects that were carried out as a result of this process. The owner of the process and the other persons in the QMC team do a lot of promotions about this process internally so that people register a complaint or a compliment on behalf of their external customers. According to the owner of the process there should be more resources assigned to this process but today only one person works full time on it. The management does not accept to assign more resources to the process.

**Quality Performance Reports**

Key Operational Performance Indicators (KOPI) and Quality Status Report (QSR) are the reports that are monthly delivered by QMC team to top management. Performance reports are based on measures described in the SLH (Service Level Handbook). The SLH describes the Service Levels that reflect

the optimum performance of the Amadeus system and business processes at levels that should deliver customer satisfaction.

The intent of these reports is to provide to Amadeus Senior Management, at a glance, a performance check of key Amadeus Operational processes. For each process there is one index which is derived from a number of sub-indexes representing the attributes which are most critical to the processes' success. The attributes and performance measurements were identified in a joint Marketing, Development and Data processing task.

Previously the QMC team used to provide some consultancy on improvement activities in different departments. However today this task is not included in their activities and they perform the activities mentioned above.

## 4.3 BPM initiative in Amadeus

Business Process Management work started in Amadeus around July 2010 and it came from the deputy CEO request who was going to become the CEO. Implementing a framework like BPM could allow the CEO to have better visibility on all the processes in the organization. The Center of Excellence (COE) project started after and was assigned to GIS organization which is the internal IT organization until it was fully resourced to operate as a separate team. Today BPM organization is consisted of a team leader, five BPM Managers, two external consultants and the QMC team.

BPM Managers in Amadeus are trained about BPM by the consultants that have developed a BPM methodology. According to them this methodology does not seek to introduce new technologies or terms and it uses the existing tools like BPMN and Lean under a common framework or context. The BPM methodology that the consultants introduced to Amadeus is:

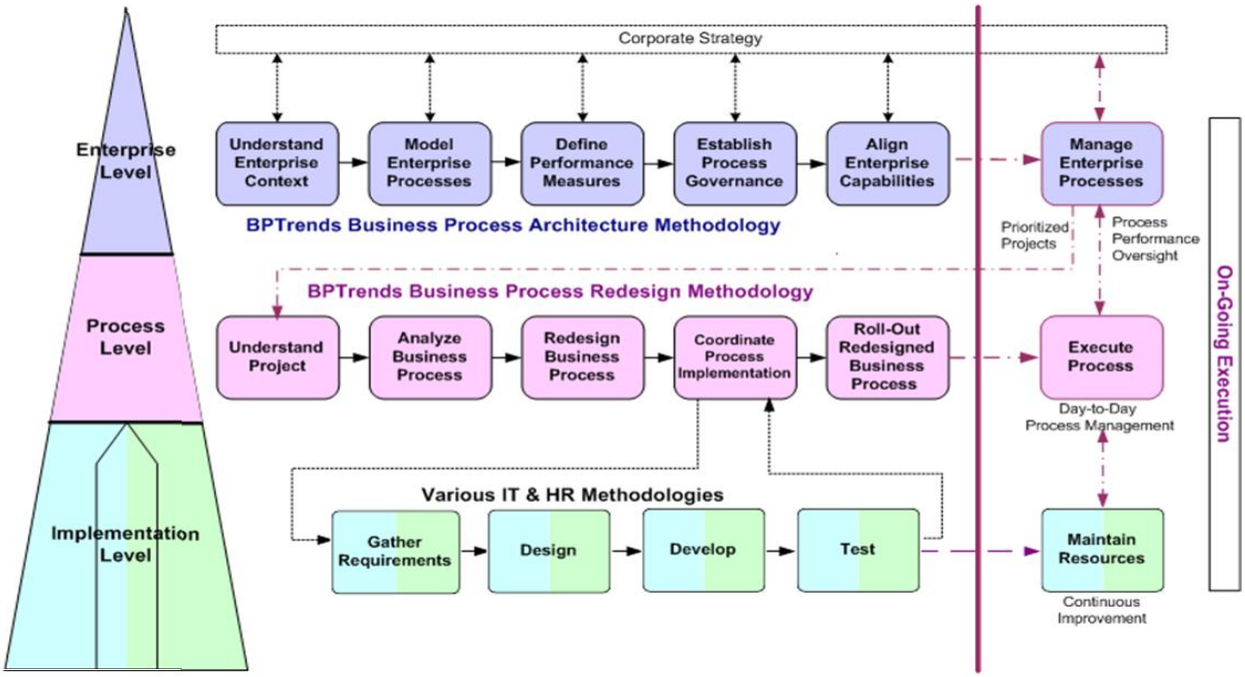


**Figure 6: Consultant's BPM methodology**

According to the consultants this framework is composed of different elements. First is the management framework, the triangle where there are four dimensions. Then within that framework there are methodologies and tools. There are 2 methodologies, first is the methodology to design business architecture and the second methodology is the process redesign methodology. So there is one framework, two methodologies and different tools within that.

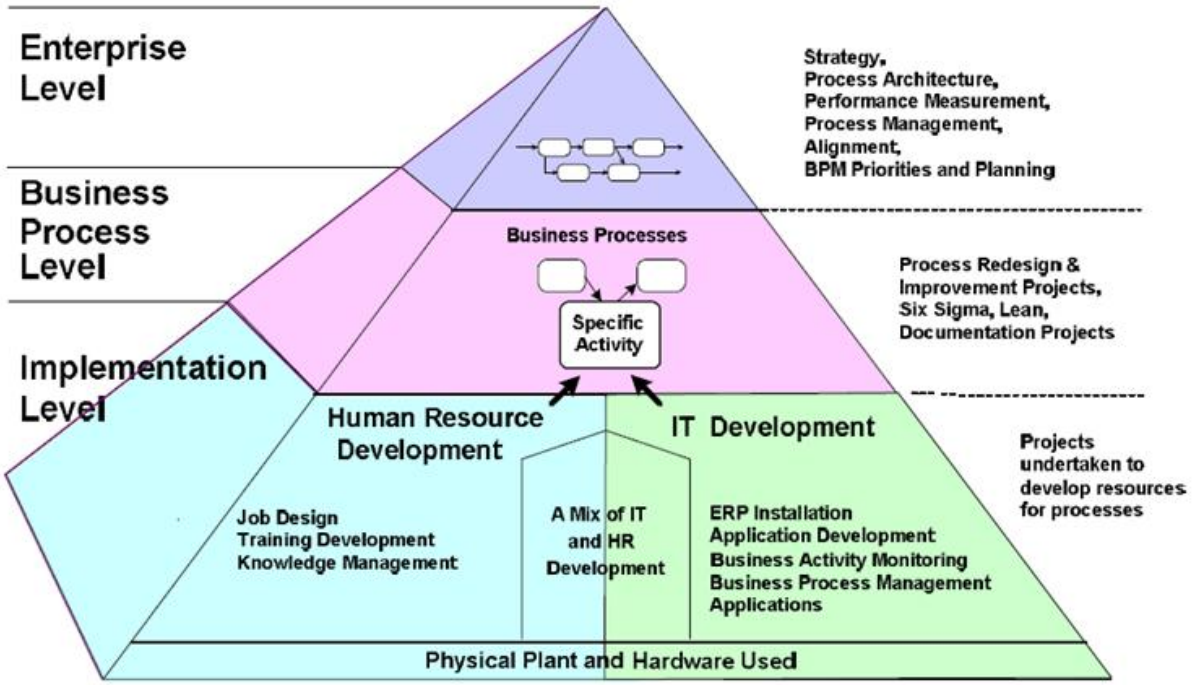


**Figure 7: The BPTrends pyramid and levels of corporate BP activities**

The management framework or the triangle was built over time by practitioners. It's based on 4 dimensions: Business Processes in Business Process Level, IT Development, and Human Resource Development in Implementation level and the processes in Enterprise Level. In the following these components will be explained according to the consultants view:

The Business Process Level in the consultants' terminology is process management at tactical process level. It is about the way the process work is approached by the companies; the methodology, the standards, and the tools that they use. In the view of consultants Amadeus Quality work has been kept at a tactical level and not considered as *a full blown corporate-wide program* and has never evolved into a strategic corporate program.

IT development in implementation level is the IT capabilities with regard to processes, process optimization, and process automation. It's the IT management and IT capabilities to support management by process. There are some tools such as ARIS, MEGA and BPMN that are used to enable process management with the help of technology.

Human resource development, another dimension in the implementation level is about process optimization or process management embedded or reflected into the HR programs, HR policies and HR levers; for example the trainings on process optimization or Lean Six Sigma or on Quality Management System. It also includes the performance management program objectives of managers or other groups that are linked to process optimization, process management, quality targets, KPIs related to certain key processes. It's about the performance system/programs that support the development of a total quality, continuous improvement mindset for management. This dimension is also about the change management programs, methodology, tools adapted to support BPM and the role of HR in change management to support the big projects related to processes improvement. The next element is the role of HR with regard to adapting roles, responsibilities, job description and competency profile whenever there are process optimization or transformation projects. All of these are about how HR programs and levers are adapted to support and leverage the benefits of process optimization in process management, Lean Six Sigma and a QMS.

The top quadrant where the enterprise level exists is about process management and process awareness at corporate level. It is concerning the existence of someone responsible for process improvement at corporate executive level or if the process improvement is part of the discussions between the top management. It's also about how process optimization is reflected in business governance; if budgets are assigned to process improvement. Another element in enterprise level is the process architecture that includes the end to end processes and the value chain showing how the company create and will create value in the future.

As mentioned there are also two methodologies in the model that the consultants introduced to Amadeus. The methodology to use in the enterprise level is the business architecture design methodology and is a 5 step methodology. It's a generic framework that companies may customize, caliber and adapt to a given situation. The first step is to define the context of BPM and organization, which is done by first of all defining the system view of the organization where you look at the environment, the key inputs, the key outputs and the supporting and the regulatory environment. The next step in understanding the enterprise context is to do stakeholder analysis, because it's based on the premise that a value creation model should be defined based on the stakeholder needs and expectation. So we need to understand stakeholders, segment them, define their expectations and needs and translate these to KPIs from their point of view.

The third element in understanding the enterprise context is to define the strategic intent of the company. This is one of the key outputs of the context analysis phase because the value creation model and the architecture is there to deliver value with regard to the strategic intent and it's very difficult to decide on which process to invest first if it's not clear on how this process contributes to the strategic intent as they have not been defined. At the end of the context phase we have a system view of the company, the stakeholders and their needs and the related KPIs are defined. The strategic intents and weight per strategic intent are also defined.

The second phase of the methodology is defining the value creation model or the process architecture and the key point here is to focus on the outcome and KPIs for each process. So it's

outcome based, if you don't understand the outcome it will be very difficult to measure anything because outcome derive KPIs.

The third phase is defining the key KPIs for key processes in the value chain and feed that back into balanced score card of the company. The fourth phase is establishing process governance, which means who is going to be accountable with regard to delivering value, measuring performance, making calls on where you should invest, to optimize which process. And the last phase is aligning capability. That is where the pain and gain exercise is used to take the process architecture and position the processes with pains, level of disfunctionality and gains, and their contribution to the strategic intent. A portfolio of process optimization/transformation project would come out of the pain and gain exercise.

The second methodology is at the process level. After the last exercise a number of high pain and high gain processes are to be identified and prioritized. Then these processes need to be deeply analyzed and optimized. The methodology at process level is to help doing this. It's a generic methodology in which you can integrate different tools, techniques that can be borrowed from different set of methodologies or philosophies like lean depending on the needs. The methodology mimics the DMAIC mindset where you define the context, you define the "as is", you measure it, you define and design the "to be" and you plan for the transition. The framework provides the tools in order to take a process that needs to be fixed and deliver the new process whether it's a redesigned transformed or optimized and connect that if required to the IT methodology or proper application development or HR optimization.

According to the consultant one of the critical purposes behind this framework is to also ensure that the company develops a unique and shared meaning and vocabulary of process. So when they talk to each other they understand each other, there is no confusion. So the purpose is not only to structure and discipline the management of process in an integrated way but also to force the company to develop a common set of meanings and vocabularies and language around process management which is the most difficult challenge and one of the place where things break down, people do not take the time to install and to implement a shared meaning and a shared vocabulary so when they talk to each other they don't understand and it's sort of confusion, confrontation, and disengagement. The consultant believes that failing to develop a common language is the reason that most of the time QMS, BPM, Six Sigma fails.

# 5 Empirical results

Based on the purpose of the research and data collection a number of clusters are identified and will be presented in the following sections. There are also some ideas/concepts that emerged from the interviews and they are relevant for the research, those will also be presented.

## 5.1 BPM understanding between interviewees

In the following the definition and the purpose of BPM according to the interviewees will be presented:

*BPM is a framework that is top-down approach, a holistic management approach that looks at processes with the customer as the starting point and the customer as the ending point. The purpose of BPM is creating value for the customer.*

*BPM is two things. Firstly is a brand that has a value, because once the way of working is established to be BPM then that can drag along a lot of initiatives plugged into that brand and secondly, it's a set of tools and it should be a common language, a common component in decision making and for that it should be linked to company strategy; it should achieve a purpose and for achieving a purpose it should deliver tools that get the company activities closer to the end goals spelled out by the strategy. The objective of BPM is to make the company less vertically oriented and more horizontally oriented to our customers and other partners and stakeholders of the company.*

*BPM is the way to manage the processes in the company. The objective is to improve processes. For me BPM is continuous improvement of processes.*

*There are many descriptions of BPM and depending on what description you take it has a slightly different angle. BPM in general is quite a vague and wide term.*

*for me BPM is to officially describe all the processes that we have in the company and to ensure that all those processes are managed with somebody taking care of the processes, looking at its definition and ensuring that it is measured and followed and improved regularly. The real objective of BPM for me is to ensure that we have a full documentation and knowledge of our processes and how they interact with each other; to ensure that we are managing the white space between the processes.*

*BPM is the way to optimize processes, to analyze them and be able to optimize the pain point, optimization, harmonization and taking into account the ROI, I mean the effort to put in place to improve it will be interesting enough compared to not doing it. BPM objective will be to have a clear view on all our processes at the corporate level, to be all aligned, harmonized and then going deeper optimizing processes, make them interacting properly.*

*BPM is to support deliver better results around our strategic intent. BPM is a process framework that defines three things per process, accountability, desired outcome and KPI in order to support again our strategic intent. So BPM starts from understanding customers and then it defines how we process customer's requirements in order to generate or produce the customer requirements and deliver that for the customer. BPM objective is to deliver strategic goals through providing end to end process framework.*

*BPM is a methodology to continuously improve business processes and consider them as an asset, something that can differentiate to your competition and that can be aligned with the processes of your customers. So the overall objective is to improve and differentiate the processes form the competition.*

*BPM is a way of applying quality really linked to business objectives.*

*BPM is in fact a management framework, first of all and that management framework is there for 2 purposes: the first purpose is to maximize alignment between strategic intent of an organization, its processes and its strategic capabilities. The second purpose is that you want to do that in order to optimize value creation to stakeholder and stakeholder is customer plus other stakeholder.*

As you can see most of the interviewees see the processes and their interaction as an important element in BPM. In other words, in their view BPM is very much linked to cross-functional processes and their management. There are also definitions in which the alignment with the strategic intent of the organization is highlighted. Some of the interviewees include focus on customer as an important element in BPM. Consistent with BPM literature one interviewee highlights the vagueness of BPM and the lack of one single definition. This is supported in this research as not everyone sees BPM in the same way.

## 5.2 BPM limitations

The limitations of BPM according to the interviewees are:

**Lack of clarity** - Some of the interviewees stated that BPM is not clear enough; it doesn't have clear definition of what it is and is not. Even for some of the interviewees that are involved in BPM projects the concept of BPM is not very clear.

One of the interviewees also believes that BPM as a new framework is very young. As he explains it's not possible to compare it to Six Sigma or Lean which they have many success stories. *I am not sure how many companies have adopted BPM in a successful way as I know in Six Sigma or Lean or TQM.*

**BPM is very heavy and expensive** - Some of the interviewees stated that BPM is quite heavy, it needs lots of training and it takes a lot of time and money. *BPM is a very slow process because it brings huge cultural changes to the organization.*

**BPM is not suitable for small improvement projects** – Several interviewees mentioned that BPM is suitable for running a large improvement but not for small improvements. One interviewee explains that *BPM wouldn't work well for smaller improvement activities which are also important because if you don't fix those then they'll become problems*. As BPM is quite heavy and applies well for large improvement projects it is not able to touch an entire organization in a reasonable amount of time.

**BPM does not provide guidelines about what to look at** – Interviewees believed that BPM provides the framework and tools for improvement but as one interviewee explains *it doesn't give*

*you guidelines or hints about what you need to look at. BPM does not clarify the requirements and it assumes that you are in a mature culture.*

**BPM does not provide any label or recognition** - One of the interviewees highlighted the importance of assessing the maturity level because it gives information about the company and it tells you where the company is and what it has achieved. BPM has no standard, there is no way to assess the maturity level and it does not provide recognition such as Quality Awards.

**Lack of control on the change** - Several of interviewees stated that BPM does not highlight verifying the effectiveness of the change you've put in place. It lacks a loop back to evaluate the effectiveness of the change that has been put in place.

## 5.3 Problems with BPM initiative in Amadeus

According to several interviewees and my own experience the problems with the BPM effort in Amadeus are:

**There is no cultural and change management programs** - Implementing BPM requires people to be oriented toward processes and considering the silo culture in Amadeus that all interviewees emphasized there should be strong cultural and change management programs. For developing a culture suitable for BPM there are no reward and recognition systems based on how managers and employees contribute to BPM. There are no objectives defined based on how people work on processes and how they improve processes. There are suitable trainings such as KPI training and BPM that is managed by the quality team but trainings are not mandatory for everyone and the resources to run the trainings are not enough. For developing a desired culture trainings are important.

Today as interviewees explained there is no change management program in BPM implementation to address the change in the way managers and people should work. There is almost no systematic communication about BPM. One interviewee explains: *this is only known by the people who have been on BPM training. It's not known, it's not published anywhere, there isn't a community of practice, and there aren't ongoing forums or anything.* Several of interviewees draw the comparison with AmaMeth which is the Amadeus Project Management Methodology and is very much used and promoted in Nice site and is widely used in development projects. Interviewees saw AmaMeth as a successful initiative in Amadeus as it is widely known and used. They explained how responsible people communicated widely about it and made people aware of it. Interviewees believed that BPM should also develop communication plans and make people aware of the initiative. One interviewee explains that if you don't pass the right message they will have resistance and implementation will be very difficult.

**Lack of concrete management support** - Another problem that was referred to by several interviewees is that although BPM compared to ISO has more management support and is the CEO's initiative, still it seems to lack real, concrete management support. It needs more resources to be assigned to it. *Today management don't really push for it. They leave it in one corner and a few people work on it, but there is no clear mandate and clear description.*

One interviewee explains: *I think as soon as it becomes so concrete that you need people, money, planning it in the budget and verifying if that is done it will not become a priority and therefore I think they are ready to speak a bit of it and do a little bit of it but not ready to really deploy it.*

*There is a discrepancy between some nice words, we want to do BPM and organization shall be process oriented with the concrete action of top management but how many people are assigned to do it? What do they have in their objectives? How is it measured? We don't have these today.*

Several interviewees stated that managers are not officially asked to do BPM; they don't have objectives based on their effort for BPM and as they explain this way BPM will not succeed in Amadeus.

## 5.4 BPM privilege in Amadeus

Based on the idea of some of the interviewees and my own observation as an intern in Amadeus, there are a number of privileges for BPM compared to ISO. As one of the interviewees stated *BPM is more readable and appealing to a wider audience.* Moreover, in Amadeus BPM is the CEO's initiative and the CEO is the sponsor of one of the most important BPM projects. One of the outcomes of this project was the corporate process architecture. Other planned outcomes are to assign process owners to important strategic processes and also to develop governance board that consists of senior managers. They will look at the performance of a number of KPIs and they will have the authority to go down stream in the organization and ask for the improvements in order to perform as expected against the corporate KPIs.

*One of the strong points that I see in this initiative today is that they want to have process owners at each level and for me this is the point.*

However some of the interviewees believed that even though BPM has been successful in attracting management attentions and CEO has assigned some resources to it, still this is not enough and it should have more support and commitment from top management.

## 5.5 BPM success factors

According to interviewees the most common factors that are critical for BPM success are:

**Management commitment** - *We need strong push and consistent messages coming from management to everybody and their real support. It is not tangible, not something that we are used to work on so we are in a learning period to get used to this new concept and the top management is going to be the main successes criteria.*

**Culture for BPM and Change management issue** - Several interviewees stated that elements of suitable culture for BPM include: continual improvement, process approach, customer focus, corporate culture, which means not working on my side I need to take into account the others. One of the interviewees explains that in a BPM workshop one of the prerequisite for the contributors was to take their corporate hat and this is the culture that is needed.

In order to achieve this culture several interviewees emphasized the importance of reward and recognition systems and trainings that can be developed with the help of human resource team. One interviewee explains that *there is so much more that can be done when HR acts as a strategic partner for senior management in creating this company culture*. There should be performance review and then accordingly recognition based on how people have helped improve processes. Managers and business units should be given objectives by top management to not just deliver on what they do but to improve processes.

Training is also mentioned by some interviewees as important element for culture making. All employees have to have trainings on processes, improvement methodology, and KPI development.

In Amadeus as mentioned by all interviewees and as is also discussed in previous student researches, there is silo culture and breaking this culture is a big challenge. One interviewee explains that *we are today an organization vertically oriented. We don't have process owners end to end, we have departments, we have divisions, we have directors, we have VPs, we have senior managers and they are only responsible for their activities that are carried out within that process for which they are responsible.* Another interviewee states that *between the sites when they say us they mean their site and they don't mean all of Amadeus. And this will make challenges in BPM implementation.*

This is not suitable for BPM because BPM will look at what is the process end to end and who should own that entire process. *In silos the transversal process is almost nonexistent. People should stop thinking in an operative way and organizations, divisions but start thinking about what the customers want, creation of value and where their position in the chain is.*

*Managing according to processes and not functions is a huge change that needs to be addressed, because maybe you touch the statuesque and the self steam of people, their way of working and operational routines.*

Interviewees believed that communicating effectively about the new initiative and involving people are very important in reducing their reluctance to change. They explained that it is important to pass the right message by effective communication. It was also discussed that without acknowledging what ISO has brought and what skills the QCs have BPM will have a strong barrier. One interviewee explained that the consultants that help Amadeus in BPM implementation said that people in Amadeus don't know what the process is and they have not mapped them. This is not true as many people are aware of processes and at one point they have mapped their processes and stored it in ARIS repository even though they are not updated now. *Denying everything that has been done will develop a strong barrier in front of BPM.*

**Process owners** - *We need to have process owners with the responsibility to ensure that the process is implemented, it works, and procedures are followed.* One interviewee explains how important is the role of process owners in BPM and warns that all the efforts around corporate process architecture and process maps would be wasted and they will lay in documentation system if the company could not assign process owners to processes. *If we succeed to have corporate process map*

*at several layers that we agree on and with process owners in each box and share that process map, communicate it, we will have done a giant step in terms of maturity.*

As two of the interviewees explain *there are people that can do improvement projects, they are trained and they have done a lot of improvement projects but it is important to make sure improvements happen at end to end processes and having process owners is important for this.*

**Process governance and performance measurement** - *We need to build a process governance board and end to end performance measurement for critical processes.* Interviewees explained that the governance board should be able to decide based on the performance data about processes in the value chain. Today there are performance reports that are generated but they are not based on cross-functional processes and in many cases as some interviewees stated, managers do not read them.

**Common vocabulary** - For people to understand each other, it is important to develop a common language around BPM and use it. The vocabulary and language should preferably be based on the one that people are already familiar with and it can be integrated with it. As one interviewee explains you cannot work in the corporate with an external methodology that they will not understand but you need common language across functions.

## 5.6 ISO 9001 according to the interviewees

According to interviewees that are knowledgeable about ISO 9001:

*ISO 9001 is a positive approach to confirm compliancy. The primary purpose of ISO is a quality stamp for external organizations to use as a reference. Having an external certification allows the outside world to know based on a same known standard if the organization is or isn't a quality-minded organization. The second purpose of ISO is to put into place a framework that guides organizations to continually improve the way that they work.*

*ISO 9001 is a framework of good practices and you apply the good practices and your company will be successful, except in the case of war or political event. But if you apple those eight basic principles every day then your company will be successful.*

*ISO is a way of implementing quality based on continuous improvement and therefore customer satisfaction. In Amadeus it is also for certification.*

*ISO is a standard so I define it as it is described in standard as a process-based continuous improvement approach, PDCA cycle. It's a checklist for management system. It's a number of things that needs to be done in the management system*.

*For me ISO is a structured way to ensure that you apply quality principles everywhere in the company so its guiding you by putting audit in place to ensure that you focus on your customer, document what you are doing, measure every time and do continuous improvement and that is implemented all over the company.*

*It's improvement based on customer feedback so it's really oriented on the customer satisfaction and the goal is being compliant with the ISO model that we respect the customer's need and taking into*

*account their satisfaction, improving our work and activities. The main goal is improve based on customer satisfaction using PDCA.*

As you can see most of the interviewees mention continuous improvement and focus on customers as part of their definition of ISO 9001.

## 5.7 ISO limitations

According to interviewees ISO has some limitations that have affected its success:

**ISO is not enough** - One interviewee stated that ISO is too much open and that's why ISO is not enough alone. It is very general and it's not mature enough. *You can have companies which are ISO compliant with very low maturity level, you need something else. BPM, CMMi, DMAIC…* Some other interviewees believed that ISO lacks the link with strategic objectives of the company.

**Negative reputation** - Because of what it was 10 years ago, ISO still has a bad reputation. As one interviewee explains *people think that it's a system that looks at documentation and looks at records and its main purpose is to make sure that there are revision and dates and document control and that's not what ISO is.*

**Not appealing language** - One of the interviewees mentioned that the standard itself and most of the communication that comes out of the ISO organization is unreadable and is not interesting. *The whole language of ISO 9000 is keeping people away from getting into it and using it*. ISO also doesn't have a good marketing campaign to market it and sell it.

## 5.8 Problems with ISO in Amadeus

According to interviewees and my own experience the problems with ISO in Amadeus that have prevented it from its full potential are:

**Lack of consensus about ISO** - It seems that in Amadeus there are a few numbers of people that see the real value of ISO and they don't consider it only for certification purpose. This could be seen in a few of the interviews for this research as well. While most people emphasized on the importance of deploying quality management principles through ISO, a few of the interviewees emphasized the certification purpose of ISO. This is also the reason that people believed ISO is not a corporate-wide program as not everyone is on the same page about ISO. One interviewee stated that *the few people that are working quality on their own is because they like it, they see the benefit, there are a few of them. Implementing ISO, CMMi, and BPM… won't change their way of thinking, for the others that have no feeling to quality they only do it when the audit is coming.*

Another interviewee mentioned that *we have the standard (ISO 9001) and we are certified against it but it is not the way that our managers act, it's mostly a matter of compliance as it is unfortunately in most of the ISO certified organizations.*

As most people see ISO only for certification purpose, the real and complete ISO is not implemented in all places. Sometimes ISO documents are created which does not reflect the real situation and is not used but it's only there as an ISO document that is needed for internal or external audits. I could

see that some departments that were informed they are selected for internal audit, they started to make some documents and upload them in the database. There are also many documents in the quality management system that are out of date. Most of the process maps that are stored in ARIS database are obsolete; thanks to ISO they have been created once but not updated after. As was mentioned before process maps are important documents for process improvement.

**Lack of complete management support** - Some of the interviewees explained that there are some managers that are not very supportive of ISO. For example one of the interviewees stated that *for ISO the QMC committee was supposed to meet 3 or 4 times a year but there was only one meeting this year*. Another interviewee explained that ISO work for departments is something to do on top of their activities and is not a priority. Mangers allow QCs to assign 10% of their time for ISO work because usually they have operational priorities and quality comes after. Another interviewee explained that it really depends on the management view and in departments that managers are quality-oriented the real ISO principles are well applied but the number of these departments are few.

Out of 4 internal audits that I was involved in one of them I could see that management was not supportive of ISO and the real value of ISO was not recognized. The non conformity that was raised was finally resolved but without eagerness.

## 5.9 ISO 9001 benefits

According to interviewees ISO 9001 benefits include:

**The possibility to do many small improvements** – Several of interviewees believed that with ISO it is possible to do many small improvements all over the organization.

**ISO will cross an organization regularly** - Several of interviewees believed that ISO will cross and check an organization regularly and systematically. One interviewee explains*: In Amadeus one third of the organization must be audited every year, the entire organization must be audited within 3 years. So if you do your ISO correctly, within a 3-year cycle you know you've touched all of the organization and hopefully you would have identified areas that need to be improved and the severity of those areas through the classification of the findings so it helps you immediately to prioritize which areas you have to first work on*.

**Clarity on the job** - ISO makes the roles and responsibilities clearer; it allows team to be better integrated to work using the same working instructions and with the clear understanding of why processes perform.

## 5.10 ISO has created a good foundation for quality and BPM

After one year of experience in the quality team I could get familiar with the idea of the members and their view toward ISO. They don't see the ISO purpose solely for certification and they attempt to deliver the full potential of ISO in Amadeus. Through their approach in internal audits, which is not based on checking the document controls, and the all trainings they have been able to put in place many best practices everywhere in the company. According to my own observation and experience and the interviewees the good foundation that ISO 9001 has created in Amadeus include:

**The mindset of quality and especially continuous improvement and customer focus** – As one interviewee explains the company overall, through the years, by applying ISO again and again has generally agreed and shared and understood that continuous improvement and processes make sense. The principles of ISO over the years have become more and more part of how people work and people understand the quality. The PDCA framework is very much used in many departments and it is a common vocabulary in the company. Thanks to the emphasis of the quality team, departments also have understood that how important is the customer satisfaction. A valuable achievement in the context of customer focus is the complaints and compliments process that was more promoted after an external audit non conformity. This process has been very successful since it has caused many small and large improvement projects.

**Performance measurement** – After the quality team's effort in making people aware of the importance of measurement and the KPI training that they provide, many departments are now very much informed about KPIs value and they are able to develop them and use them as a decision making support.

**The process work** - As one interviewee explains ISO is the basis of processes, linkage of processes and continual improvement. ISO is about putting in place a process if it doesn't exist and improving it; so the good foundation is that processes exist. Process improvement begins with process mapping and thanks to ISO many people in Amadeus know the importance of the process maps and how to map the processes even though not all of them have their processes mapped and updated. *If people didn't even know what process is how they could improve it? All the work done in terms of documenting processes is a good foundation so we already have a mindset of documenting the processes*. Many departments have also put in place dashboards and they measure the performance of their processes.

**Quality Coordinators** - In Amadeus there are Quality Coordinators who understand more or less the requirement of ISO and who are able to ensure that their department meets those requirements and they know how to run an improvement project. These people can be used in process improvements efforts in BPM.

## 5.11 ISO 9001 and BPM

Most of the interviewees believed that ISO 9001 is a set of requirements for quality management and it specifies what needs to be done. On the other hand BPM is the way to improve the processes and it specifies how to achieve the desired outcomes. They believed that ISO's and BPM's objectives and their scope are different and they saw them more complementary. One interviewee explains: *I don't put ISO and BPM in the same level. We have a set of requirements to get the standard and we have the improvement framework.*

Another interviewee explains*: ISO tells you in which areas you must pay attention to. There is a list of 8 clauses and you must be compliant with each of those but BPM has no guideline as to what you must or must not consider.*

Almost all of the interviewees highlighted the "continual improvement" and "process approach" as two important elements in BPM but there was no consensus about the "customer focus" element in BPM. Some of the interviewees argued that ISO is very much oriented to customers and it explicitly requires you to pay full attention to customer satisfaction but BPM is not necessarily oriented to customers and process improvements can be done even without the aim of satisfying customers. One interviewees argued that you can do process management without having the customer in the center, *I'm not sure that everything you do is to serve better your customers. You can say I have mapped my customer requirements but I don't care about their experience.* Furthermore, BPM is not a standard, it cannot be audited, there is no obligation, whereas in ISO 9001 if you want to be certified you need to apply all the requirements, you have to listen to your customer, you have to do survey and work on complaints.

Another theme emerging from the interviews was that whether it is included in its purpose or not, ISO has not been able to link the quality work in Amadeus to the strategic intent of the company, ISO has not been considered as a strategic corporate-wide program that should have the commitment from top management. On the other hand some people highlighted the fact that BPM is very much linked to the strategy and its aim is the alignment between company processes and the strategic intent. Head of the BPM team states that: *I want my team to familiarize themselves with where this company is going and what the strategic objectives are.*

One interesting observation was that when comparing ISO and BPM, people that had less knowledge or very few knowledge about ISO emphasized the compliance-oriented feature of ISO and certification issue compared to BPM. They believed that ISO is a matter of compliance and is there to ensure the certification whereas BPM brings more value to the company by not focusing on compliance or obtain the certification.

## 5.12 Applying ISO 9001 and BPM together

Almost all of the interviewees believed that ISO 9001 and BPM can be and should be applied together in Amadeus, but as two interviewees states they should not be set up to compete with each other.

One interviewee explains: *we are compliant but here we are a very big organization and ISO is not enough. We did ISO in Amadeus with such a good achievement and we keep it but it should be the better way and BPM can help us.*

As we saw several interviewees explained how ISO has created a good foundation and has made the company ready for a complementary program**:** *given that we are already ISO compliant and there are so many departments who give importance to structure and to process, procedure, continual improvement, we can implement BPM now. Without this it would have been impossible to implement BPM.*

According to interviewees the most common reasons that ISO and BPM can work together are:

**ISO gives the direction and BPM helps achieving some of the quality objectives**

*ISO gives the direction and sets the requirements but it does not tell how to achieve them. In complex systems you need to have a methodology to improve.* BPM provides the tools and the methodology to improve. One of the interviewees also mentioned that when the ISO team does presentations about ISO requirements people ask for more guides, they need practical help or guidelines and here BPM can help.

**ISO gives an external additional value**

The recognition and the certificate in ISO are really important because BPM doesn't provide this. *ISO is an international standard, it's something that we can sell to customers, as a reference point of our commitment to quality.* Some of the interviewees also mentioned that since Amadeus is the only GDS (Global Distribution System) that has the certification then it should be kept and used.

**ISO ensures that the whole company is verified against quality**

In Amadeus with ISO many parts of the organization can be checked and verified against the important elements of quality management such as continual improvement, performance measurement and customer satisfaction. And within three years the whole company will be checked and verified. *ISO will touch more of the organization more frequently.* ISO will address many small problems and will prevent them from getting big, it causes many small improvements.

**ISO and BPM feed each other**

*One output is the input of the other*. Whatever ISO finds through audits or other ways such as customer complaints can feed into being an improvement project that goes into the project pipeline of BPM, where it can be prioritized. Once a BPM project is implemented ISO can help going back in to do an audit, to verify the effectiveness of that improvement project.

As it was mentioned before some of the interviewees stated that BPM does not highlight verifying the effectiveness of the change you've put in place. In this situation *ISO can complement BPM by auditing the improved areas and making sure all the changes that have been put in place last in the time; The C in DMAIC*.

**BPM as an opportunity to develop system and process approach**

All of the interviewees stated that in several Amadeus sites such as Nice there is silo culture and processes that pass through several departments are not coordinated. *Some processes stops when they are out of the division.* interviewees believed that when it comes to cross-functional processes the process approach is not well developed and departments do not see themselves as units that should work together to achieve the objectives of the company, therefore, lacking a system and holistic approach. The process approach inside departments is not advanced neither and there is a need to update process maps and define the outcomes and measures of processes.

Most of the interviewees believed that implementing BPM is a good chance to develop process and system approach. One interviewee stated: *I see the current initiative of BPM as a new chance to apply process approach in the company, in the areas where it is not applied.* Some of the interviewees stated that BPM has more holistic approach and encourages system thinking in the company because it looks at the processes as a whole to deliver results for the value chain.

**ISO ensures the focus on individual processes, BPM ensures the focus on critical and cross-functional processes**

Interviewees argued that with ISO we can do many small improvement projects inside each process. BPM on the other hand ensures a more holistic approach and considers the critical processes and their management based on companys' objectives. One interviewee states that BPM is the framework for improving prioritized large improvement initiatives. BPM will focus on the processes that have the highest impact to the value chain. The advantage of ISO as two interviewees highlight is that by focusing on small problems it avoids them from getting big problems. Small problems should also be looked at and resolved: *BPM might focus on high pain and high gain areas but we need to evaluate other places too.*

Another interviewee highlights the importance of connecting process improvements to the value chain and avoiding sub optimization: *with ISO you have a lot of projects for process optimization but eventually they do not deliver the value from end to end. You can work bottom up for a while and it's good to do some process optimization at tactical level but eventually you need to connect it to the value creation model otherwise you will waste some money, you should invest where you should.*

**With BPM we can contribute to the strategic intent**

Almost half of the interviewees stated that ISO in Amadeus is not considered as a corporate-wide program and lacks full management commitment and it could not deliver the strategic intent and business needs. On the other hand a number of interviewees believed that BPM is very much linked to the strategic intent of Amadeus because it focuses on the value chain and it aims at aligning processes with the strategic intent. It also has the CEO's support as he has decided to implement it.

Some interviewees explain that ISO 9000 is at very operational level which for the linkage with top management intention BPM can come in. With BPM we will know which process should be the focus of our strategy and where we should improve, with BPM we need to make sure we address business needs.

A few number of interviewees believed that ISO and BPM can be applied together if ISO activities are done with the objective of getting a certificate and BPM as a lever for improvement and management of the processes.

In the contrary another interviewee believed that *ISO and BPM can be integrated to create more value but it requires that you see ISO not as documentation compliance but as another lever to leverage and get the company to a quality continuous improvement mindset.*

# 6 Analysis and discussion

In this section the BPM initiative and the ISO 9001 work in Amadeus will be analyzed through the lens of the framework which was introduced in the theoretical framework chapter. The research questions will be answered based on the theoretical framework and the empirical data.

## 6.1 BPM initiative through the lens of the framework

In chapter 3.1 a framework was introduced that presents the factors influencing actual action when a management initiative is introduced. Together with the empirical data, the possibility of the BPM initiative to be successful can be assessed with this framework. Book et al. (2004), and Armistead and Machin (1997) discuss that in reality, the understanding of the processes is often at the task level and the main focus may be on process maps and descriptions. It is important to avoid this risk in Amadeus. The framework helps identifying the elements that allow BPM to be integrated into the behavior of people. Based on the framework for the initiative to be practiced in action it needs to be integrated in the tacit guiding structure that guides behavioral patterns. Therefore the two structures, explicit normative and documentation, need to be influencing in a way that affect the intuitive way of working.

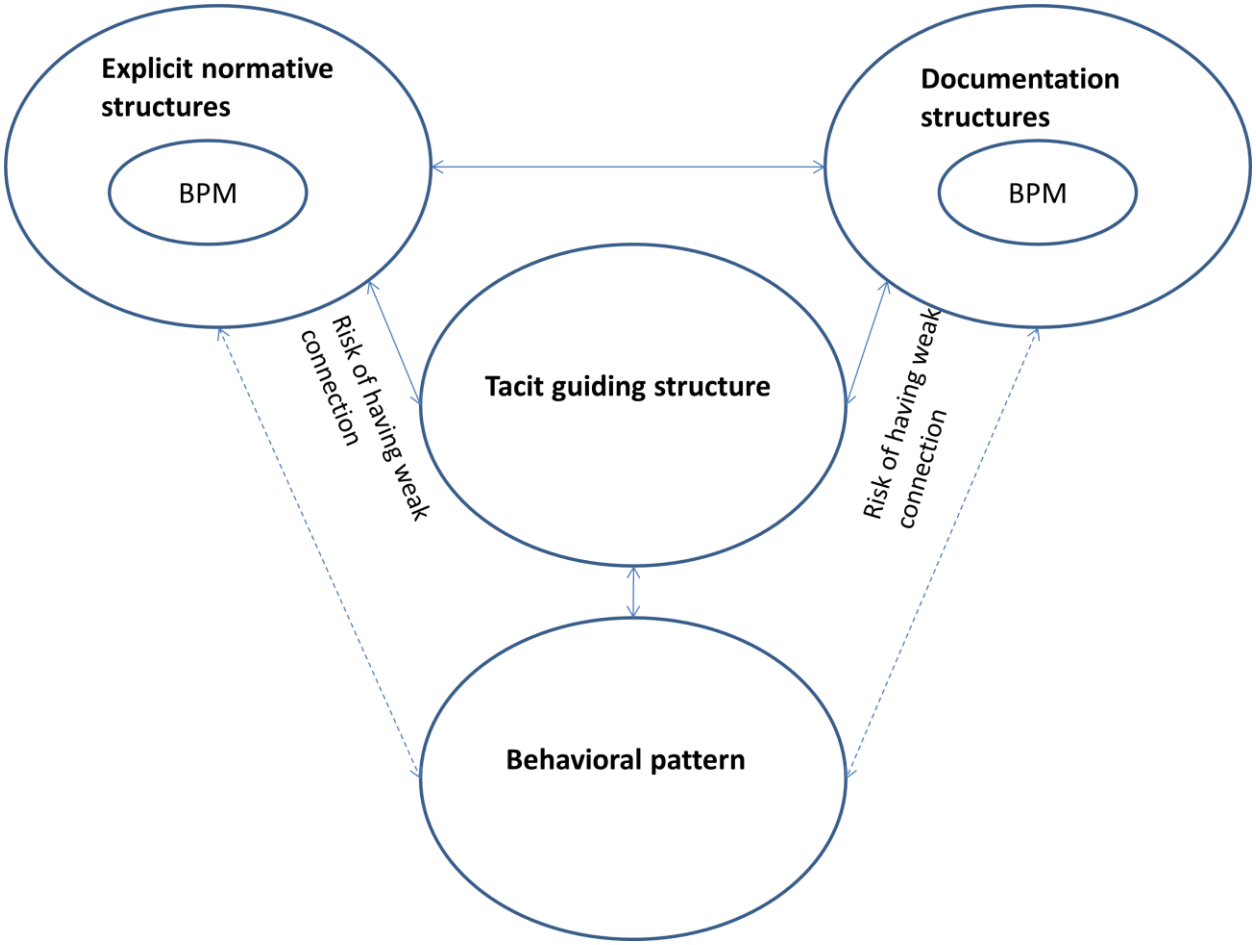


**Figure 8: BPM initiative through the lens of the framework**

If managers in Amadeus support BPM informally, communicate about it and accept it for example when they discuss in meetings but in reality and day to day work they orientate to another way of working this will be a sign of weak relationship between explicit normative and tacit guiding structures. Consistent with this framework several interviewees warn that managers will speak about BPM but they will not commit to it and deploy it since BPM objectives are not defined for senior managers and is not included in their MbOs (Management by Objectives).

The same applies for the documentation structure. If we only produce process maps and descriptions as BPM documentation and in reality continue working in old ways that might not be consistent with these documentations then we undermine the BPM initiative. These are the risks that if not avoided, will make BPM unsuccessful. One of the interviewees warned about the situation when *BPM will lay somewhere in the documentation system* and emphasized the importance of having process owners. This has been also emphasized by other interviewees.

## 6.2 ISO 9001 through the lens of the framework

As was mentioned before in chapter 5.8 the ARIS process repository in Amadeus is not updated and in most cases is obsolete. It was also mentioned that some departments that were informed they are selected for internal audit, they started to make some documents and upload them in the database. There are also many documents in the quality management system that are out of date and are not used. Through the lens of the framework this shows two different not-aligned structures in documentation: the process documentation that are not updated and the documentation that exists about the actual way of working such as job descriptions, department activities. For some departments that are CMMI certified there is also documentation regarding CMMI activities.

As explained in chapter 3.1 among several requirements, the model requires a good correspondence between the explicit normative structure and documentation structure. Based on data collected through interviews and observing some situations there is a weak correspondence between the normative and documentation structures in Amadeus for ISO. The ISO documentation exists almost in all departments in Amadeus as it's a requirement and will be checked through internal and external audits although sometimes these documents are not the real documents or don't reflect the actual way of working, as discussed earlier.

As mentioned earlier one of the interviewees stated that *for ISO the QMC committee was supposed to meet 3 or 4 times a year but there was only one meeting this year.* Another interviewee pointed out the fact that for some departments the added value of ISO is not recognized by the head of the department and in some cases the requirements of ISO are met only to resolve a non-conformity without acknowledging the benefits of doing so. In another situation which I was involved personally the management was not convinced to assign resource for quality work however to be compliant the requirement that the auditor highlighted was met without eagerness. These are the signs that show some managers are not very supportive about ISO.

What we see here is that there are some cases in which the correspondence between documentation and the explicit normative structure is weak because departments produce ISO documents but head

of the departments or even top management that form the QMC Committee do not necessarily support ISO.

As explained in chapter 3.1 about the framework, explicit normative and documentation structures need to be integrated into the tacit guiding structure. One of the interviewees mentioned that *we have the standard (ISO 9001) and we are certified against it but it is not the way that our managers act, it's mostly a matter of compliance as it is unfortunately in most of the ISO certified organizations.* This statement shows the weak connection between explicit normative structure and tacit guiding structure. A strong connection between the documentation structure and the tacit guiding structure cannot be seen neither because in some cases there are ISO related documents but the actual ways of working is orientated in another way (outdated process maps, teams producing documents when they know they are selected for audit…)

The above analysis can be summarized in below picture:

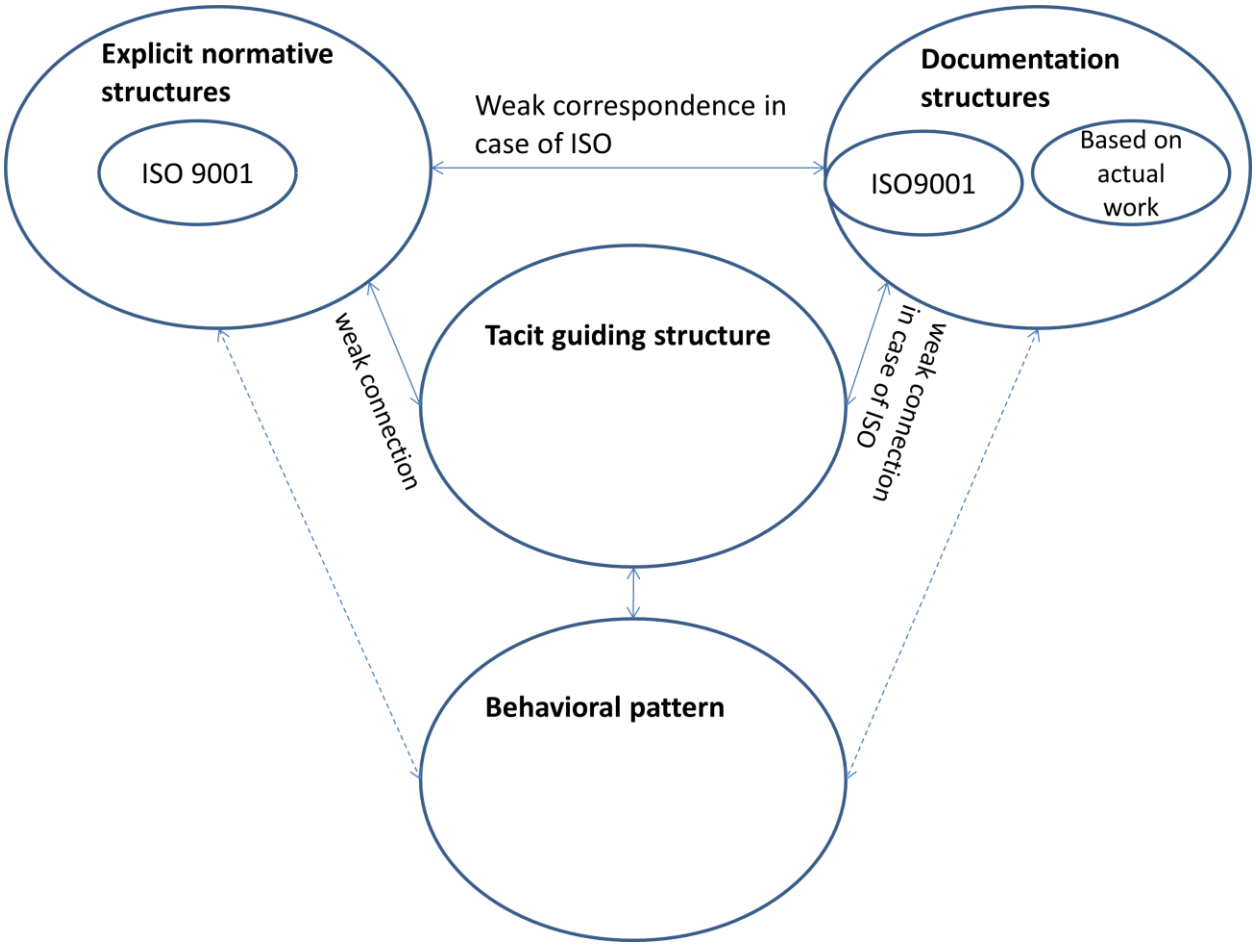


**Figure 9: ISO 9001 through the lens of the framework**

## 6.3 Answering the research questions

### 6.3.1 How are ISO 9001 and BPM positioned relative to each other?

Based on the discussions in the theoretical framework and empirical data ISO 9001 and BPM have different scopes and address different areas. ISO sets the requirements for a quality management system based on Total Quality Management philosophy; it clearly states in which areas an organization should pay attention, there are 8 clauses that clarify this. ISO has good contribution to a number of TQM principles however it has not been successful to highly contribute to another set of TQM principles such as "system approach to management".

BPM on the other hand provides a common framework and a set of tools to go about improving critical processes of the company. These processes are usually cross-functional and have direct contribution to the value chain. BPM helps achieving some of the quality management objectives because it has good contribution to a number of TQM principles. However, it does not contribute highly to some other TQM principles. BPM also brings some benefits that are not covered and delivered by ISO 9001. This includes delivering the strategic intent of the company through management of critical processes.

ISO 9001 is an international standard, is widely known and is very clear. It enables external companies to get an idea about the extent to which the company is quality-oriented. BPM on the other hand is not a standard and is not very clear. As we saw one of the limitations of BPM is its lack of clarity. Once BPM is clearly defined and well implemented, it is a good framework for internal use but not for external use and for selling to customers.

With ISO 9001 it is possible to evaluate and check the whole company in a reasonable amount of time. Through audits departments are evaluated against application of PDCA cycle and doing improvement projects, satisfying their customers, and measuring their performance. Therefore ISO can result in many small or medium improvement projects in different departments. As it was discussed by some interviewees ISO addresses small problems all over the company that if not resolved will get big problems. On the other hand BPM as a framework for improvement of critical processes is not suitable for day to day improvement projects because as was discussed before the man-hours involved in a BPM project are high so it is heavy and expensive. However, it is ideal for big process improvement projects that cross different departments and deliver huge improvements as it touches value chain processes that are linked to the strategic intent of the company.

### 6.3.2 Do they complement each other? If yes, how?

According to the theoretical framework and the empirical data ISO 9001 and BPM complement each other. ISO 9001 has created a good foundation for TQM and BPM can help progressing toward TQM implementation. As we saw before it is widely discussed in the literature and by some of the interviewees in this research that ISO alone is not enough for a company because it partly contributes to TQM. In addition it sets the requirements but does not provide guidelines for achieving the desired outcomes. BPM can help ISO and complement it through better contribution to some of the TQM principles and also through providing methodology and tools for improvement.

According to the discussions in the theoretical framework about ISO 9001 and BPM contribution to TQM principles we could summarize the results in below table. The results presented in this table are supported by the empirical data:

| TQM principles | ISO 9001 | BPM |
|---|---|---|
| Customer focus | HC | MC |
| Leadership | MC | M/HC |
| Involvement of people | LC | M/HC |
| Process approach | MC | HC |
| System approach to management | LC | HC |
| Continual improvement | HC | MC |
| Factual approach to decision making | MC | HC |
| Mutually beneficial supplier relationships | LC | - |

**LC=Low Contribution HC=High Contribution MD=Medium Contribution -=difficult to analyze**

**Table 5: Contribution of ISO 9001 and BPM to TQM principles**

**Customer focus in integrated ISO and BPM** – Following the discussions in the chapter 3.5.1 we could conclude that the contribution of ISO to "customer focus" principle of TQM is high. From empirical data this was supported too because as was stated in chapter 5 many interviewees believed that ISO is very much oriented toward customer focus and it has brought many achievements in this regard for Amadeus. These achievements include: the importance that people give to customer satisfaction and their effort to measure it; and the promotion of customer complaints and compliments process and encouraging people to use this process as a platform for customer orientation.

On the other hand the contribution of BPM to "customer focus" principle of TQM is medium because in the literature it is discussed that BPM through cross-functional process management attempts to improve customer focus by avoiding the limitations of managing by vertical functions. This is an indirect contribution and this principle of TQM is not highlighted in BPM. There was no consensus among interviewees in this regard. Some of them believed that BPM is very customer focus because it looks at customer requirements as inputs for processes and it delivers outputs based on those requirements. However, other interviewees believed that BPM is not very much oriented to customers and does not highlight customer satisfaction. They believed that process management can be done without having the customer in the center and customer requirements can be mapped but their experience can be ignored.

By applying ISO 9001 and BPM together we can make sure that we address this principle of TQM. ISO highlights focus on customers and makes sure that we focus our efforts to satisfy them even though BPM does not necessarily aim at customer satisfaction. However, if we remove ISO we cannot guarantee that BPM alone can promote and achieve customer satisfaction.

**Leadership in integrated ISO and BPM** - As was discussed in the chapter 3.5.1 ISO 9001 has medium contribution to "Leadership" principle of TQM. This is also supported by empirical data. As

one interviewee mentioned supporting ISO really depends on the management view. In some departments where their managers are quality-minded ISO is well applied and managers support the quality work. However, the numbers of these departments are not high. In other places where managers do not believe in ISO they only do it because of audits. Therefore we can see that in Amadeus a few managers show commitment to ISO and some do not. Moreover, as was discussed before one of the problems with ISO in Amadeus is that it is not considered as a corporate-wide program. This shows that it lacks the full support from top management. A corporate-wide program is strongly pushed in the company by top management and there are usually objectives set for people based on their performance related to the program. ISO in Amadeus lacks the top management support and it has not been able to attract the support from all managers and make them act as role models in line with total quality management philosophy.

BPM as was discussed in chapter 3.6 can have medium or high contribution to the "leadership" principle of TQM. Consistent with this discussion the empirical data suggest that if BPM succeeds to be a corporate-wide program meaning that it gets full management support and it will be implemented by considering its critical success factors discussed in this research then it can highly affect the way managers act. As one interviewee explains BPM as a brand can be very powerful in attracting resources and management support. Although ISO in Amadeus has not been very successful to obtain full management support, if it gets integrated with BPM in a new and more appealing package, then it can be a magnet for management commitment.

**Involvement of people in integrated ISO and BPM -** As was discussed in the chapter 3.5.1 ISO has low contribution to "involvement of people" principle of TQM. As mentioned previously the standard addresses human resource issues that are related to training requirements such as procedures for identifying training needs and qualifications of personnel. Other human resource issues that are very important for TQM such as training in quality related issues and development of employee participation programs are not addressed. This is also supported by empirical data. As was discussed before people are not at the same page about ISO. There are only some people in Amadeus that do not see ISO only for obtaining the certification and that try to implement it with its full potential. Furthermore, ISO work is not included in the objectives of people unless for QCs who need to assign 10% of their time to quality related tasks. Usually QCs work on ISO when the department is going to be internally or externally audited.

On the other hand successful BPM implementation as was discussed before requires developing appropriate training and change management programs and reward systems that aim at reducing people's barrier to change and make them involved in process management. As was discussed previously if BPM program is considered to be a corporate-wide program and systematically changes the culture of the organization in line with quality management requirements then involvement of people can be guaranteed. It highly depends on management view and the change management practices; if managers in Amadeus encourage process management and act as role models then people will be process-minded. Once more integrating ISO and BPM can be very useful in Amadeus because ISO is weak in making people involved; BPM can act as a lever to achieve this and get closer to TQM.

As was mentioned before ISO has not been very successful in contributing to soft TQM principles such as "leadership" and "involvement of people". BPM should highly cover this gap by applying the principles of a successful BPM implementation that will be discussed later in this research.

**Process approach in integrated ISO and BPM** - As was discussed in the chapter 3.5.1 ISO has medium contribution to "process approach" principle of TQM. ISO has been successful in making companies map their processes, train about processes and provide process documentations even though in some cases these documents do not reflect the real work. But the mind set about process documentation, understanding the inputs and outputs of a process and developing process measures have been established. However, ISO has not been successful in developing a process approach as ISO 9001 new versions (2000 and 2008) hope. As was discussed before many organizations applying ISO 9001 do not assign time and resources to important tasks required for effective process management such as process ownership and performance management based on end to end processes. As was discussed earlier in the empirical data for this research it can be seen that some people believe ISO has created a good foundation for BPM through process work. Many people in Amadeus know the importance of process mapping and documentation, process measurement and process improvement. However, they also believe that ISO has not been able to remove the silo culture in Amadeus. Therefore when it comes to cross-functional processes ISO has not been successful in developing process approach.

BPM on the other hand has a high contribution to this principle of TQM. As was discussed, this has been highly supported in the literature. BPM provides detailed guidelines and extensive help for applying this principle of TQM. This is also in line with the empirical data as many interviewees saw process management and process approach as an important element in BPM. However, as the main focus in BPM is on critical and cross-functional processes, with BPM this principle of TQM might only be applied to this type of processes. By applying ISO and BPM together we can make sure that the process approach and process work such as documentation, measurement and improvement are applied to all processes both critical and normal processes.

**System approach to management in integrated ISO and BPM** – As was discussed in chapter 3.5.1 ISO has low contribution to this principle of TQM. The standard requires identification and management of interrelated processes but it does not necessarily encourage the end to end process approach as a process management program such as BPM would encourage. It also does not address the business results as ISO 9000:2005 explains. In the empirical data this is also supported as interviewees believe that there is silo culture in Amadeus and the company is vertically oriented and there are no process owners to facilitate end to end process management. It is also discussed by some interviewees that ISO has not delivered the strategic intent of the company. This shows that ISO has not been able to encourage a system approach in Amadeus.

BPM on the other hand has high contribution to "system approach to management" principle of TQM. This is also supported in the empirical data as almost all interviewees believed in the importance of managing interrelated processes in BPM and also in BPM's ability to deliver the strategic intent of Amadeus through managing critical processes that are directly linked to the value chain.

Integration of ISO and BPM in this situation is very critical considering the weak contribution of ISO to "system approach" principle of TQM. As was discussed before, "system approach to management" is a soft principle of TQM and is not well addressed by ISO. By applying ISO and BPM together in Amadeus we can make sure that we leverage BPM power in this principle and that a more holistic view is achieved.

**Continual improvement in integrated ISO and BPM** – According to the discussion in chapter 3.5.1 ISO has high contribution to this principle of TQM. This is also supported by empirical data as ISO through the efforts of the quality management team and their correct interpretation of ISO which is not solely based on obtaining certification, has been able to develop continuous improvement mindset among people. PDCA cycle as mentioned before is used in many departments as a framework for continuous improvement.

BPM on the other hand has medium contribution to this principle of TQM. BPM is based on continual approach and many authors believe in this. The empirical data also support this as almost all of the interviewees highlighted the continuous improvement as important element in BPM. However as mentioned previously BPM focus is on critical processes of the company. If we remove ISO, BPM alone is not able to bring the continuous improvement mindset and to cause small or medium improvement projects in operational processes. Smith and Fingar (2003) believe that *BPM is most powerful where the processes it manages are complex, fluid and difficult to coordinate*. BPM is expensive and heavy and is not suitable for small improvement projects. ISO is ideal for this type of projects as discussed by several interviewees. Therefore, it is essential to integrate ISO and BPM in order to have incremental and radical improvements all over the company and to ensure continual improvement for all processes.

**Factual approach to decision making in integrated ISO and BPM** – According to the discussion in chapter 3.5.1 ISO has medium contribution to this principle of TQM. However, in Amadeus many interviewees believed that ISO has been successful in developing this principle of TQM in Amadeus. After the quality team's effort in making people aware of the importance of measurement and the KPI training that they provide, many departments are now very much informed about KPIs value and they are able to develop them and use them as a decision making support. This was discussed as a good foundation that ISO created in Amadeus. However, correct data and measures do not exist for end to end processes and this makes the performance measurement of these processes difficult.

In BPM literature there is consensus that performance measurement, an important element in "factual approach to decision making" principle is very critical in BPM and is considered as a critical success factor for it. From the empirical data we could also see that setting process dashboards and having governance board to decide based on the performance measures of critical processes is critical for BPM. If BPM is well implemented and is integrated with ISO we can make sure the development and control of measures at high strategic levels that are cascaded down to operational measures because thanks to ISO today there are many useful measures developed at operational levels and what BPM can bring is to link them to high level and strategic processes.

**Mutually beneficial supplier relationships in integrated ISO and BPM** – As we saw before ISO has low contribution to this principle of TQM. In addition it was not possible to evaluate the amount of BPM contribution to this principle. As Amadeus does not have many suppliers, in this research the data about the amount of ISO and BPM contribution to this principle were not collected. Perhaps the consulting firms that provide human resources for Amadeus can be considered as strategic suppliers because human resources for a company are essential resources especially for a company such as Amadeus that very much depends on its employees to develop software programs. In future researches it would be useful to evaluate how much BPM can contribute to better relationship with this type of suppliers.

As was previously discussed in sections 3 and 5, there are more benefits that can be achieved from ISO 9001 and BPM integration:

**ISO and BPM feed each other -** *One output is the input of the other.* Whatever ISO finds through audits or other ways such as customer complaints can feed into being an improvement project that goes into the project pipeline of BPM, where it can be prioritized. Once a BPM project is implemented ISO can help going back in to do an audit, to verify the effectiveness of that improvement project and to make sure all the changes that have been put in place last in the time.

**With BPM we can contribute to the strategic intent –** As was discussed ISO in Amadeus is not considered as a corporate-wide program, it lacks full management commitment and it could not deliver the strategic intent and the business needs. It is also discussed in the literature that ISO places no emphasis on business results and it is not tied to business decisions and strategy (Lee et al., 1999 and Reimann and Hertz, 1996). BPM on the other hand is discussed both in the literature and by several interviewees in this research that is very much linked to the strategic intent of the company because it focuses on the value chain and it aims at aligning processes with the strategic intent. By integrating BPM and ISO in Amadeus it seems that we can make sure the strategic intent is delivered because BPM clarifies which processes should be the focus of our strategy and where we should focus. As argued by Pritchard and Armistead (1999) managing business processes is providing a link between the top of the organization and activity at the lower levels.

As it was discussed in detail integration of ISO 9001 and BPM would be very beneficial for Amadeus to progress toward total quality management. One can fill the other one's gaps. However as one interviewee mentioned they should not compete with each other and fight for resources. As discussed by some researchers such as McAdam and Jackson (2002); and Lee et al. (1999) and one interviewee in this research it also requires that we see ISO not as documentation compliance or for obtaining the certificate but as another lever to get closer to TQM philosophy. While a few interviewees believed that ISO and BPM can be applied together in a way where ISO activities are done with the objective of getting a certificate and BPM as a lever for improvement and management of the processes, a major finding of the present research is that it is not a good idea to consider ISO only as a mean to obtain the certificate.

### 6.3.3 What are the suggestions for successful BPM implementation?

Based on the discussions in the theoretical framework and interviewees' opinions, in the following I will present the suggestions for successful BPM implementation.

Following the discussion in the analysis of BPM through the lens of the framework introduced in chapter 3.1, it is concluded that for BPM to be acted in practice it needs to be integrated in the tacit guiding structure. For that the BPM as an explicit normative structure and its documentations such as process descriptions and maps should be influencing in a way that affect the intuitive way of working. As was discussed if management in Amadeus support BPM informally, communicate about it and accept it for example when they discuss in meetings but in reality and day to day work they orientate to another way of working then BPM would be a normative structure that is only talked by managers but not acted by them. Furthermore if we only end up with a number of process maps for critical processes that are buried in the documentation system without using them for improvement or keeping them updated then BPM initiative in Amadeus will be unsuccessful. We need strong top management push and effective change management programs. Top management needs to consider the BPM initiative as a strategic and holistic program that makes people work in line with BPM. One interviewee explains his experience in General Electric, and he states that Six Sigma was the way they worked. The CEO of General Electric said "we are going to implement Six Sigma and it's going to be the biggest transformation initiative in the history of this company and everybody should embrace it and make it the way we work". BPM in Amadeus needs this push from top management.

Considering the fact that Amadeus is very siloed and vertically-oriented there is a need for change management program because for BPM people need to have corporate culture and think of delivering for end to end processes. Thanks to ISO today in Amadeus many people have the mindset of continuous improvement and performance measurement but this only applies to their direct tasks and processes. For BPM we need to encourage them to think about the whole picture and about the cross-functional processes that make the value chain. For this HR needs to be a strategic partner for BPM so that the required trainings, reward systems and performance reviews are set in accordance with BPM requirements.

There should be mandatory trainings about end to end processes and their success factors based on the strategic intent of the company; also more trainings on KPIs and improvement methodology for individuals. Formation of cross-functional teams as was discussed before is essential in BPM implementation. These teams should also be trained and assigned to work with process owners to optimize cross-functional processes. As was discussed previously the quality team delivers many useful trainings. The resources to run these trainings to more people should increase. In order to have the commitment from senior managers, objectives should be set for them based on their contribution to BPM which then are evaluated in performance reviews. The reward and recognition systems need to be put in place in order to encourage people to work on cross-functional processes and break the silos.

Systematically communicating about the BPM initiative and the BPM concept is also essential for managing the change to a process based culture and it should be prioritized in BPM implementation in order to reduce the barriers to change. As several interviewees explained AmaMeth is a successful

program in Amadeus and can be a role model for BPM implementation. For AmaMeth there are strong communication campaign and communities of practice that promote AmaMeth and support people in using it. BPM team can benchmark AmaMeth's success and also use the expertise of its team in managing improvement projects.

As was discussed in the theoretical framework several companies that have implemented BPM referred to its vagueness as one of the biggest difficulties in the implementation. In order to avoid this difficulty in Amadeus it is suggested to clearly define BPM and communicate about it through informative sessions such as CAST sessions that aim at informing people about the activities of other teams. A definition of BPM should be discussed in the team and agreed upon; the roles and responsibilities of the BPM team need to be clear as well. This will enable the BPM team to be clearer about the new initiative and also be able to communicate about it.

As is widely discussed in the literature and by several interviewees assigning process owners to critical end to end processes is essential for BPM implementation. Process owners should be at the senior management level or report directly to a senior manager. The data and measures about all of these end to end processes should then be reported to an executive board consisting of top management or a Chief Process Officer that has the power and the authority to assign sufficient resources for process optimization.

# 7 Recommendations and concluding discussion

## 7.1 Integrating ISO 9001 and BPM

If we add the BPM initiative in the model discussed in chapter 3.1 we will have another norm and another set of documents (see figure 10). What is important is the alignment of the elements inside the explicit normative structures. This means that if we introduce different initiatives in the organization we need to see how they are connected and related to each other. They should not be conflicting or competing and fighting for resources. This is another reason that highlights the importance of this research since it helps identifying the roles of ISO 9001 and BPM initiatives and evaluating them relative to each other. Studying CMMI initiative in Amadeus is not in the scope of this research but it is recommended to do a similar study about the position of CMMI, ISO and BPM relative to each other.

Through the lens of this framework ISO 9001 and BPM as two norms should be studied and integrated to the level that is possible. It is essential to know where they might overlap, where they might be complementary or how their goals can be connected to each other. This should be clear in the minds of managers so they can relate different norms to each other. Current research can facilitate this understanding. As was discussed previously this understanding will help avoid confusion which can cause weakening of couplings to the tacit guiding structure (Marmgren et al. 2012).

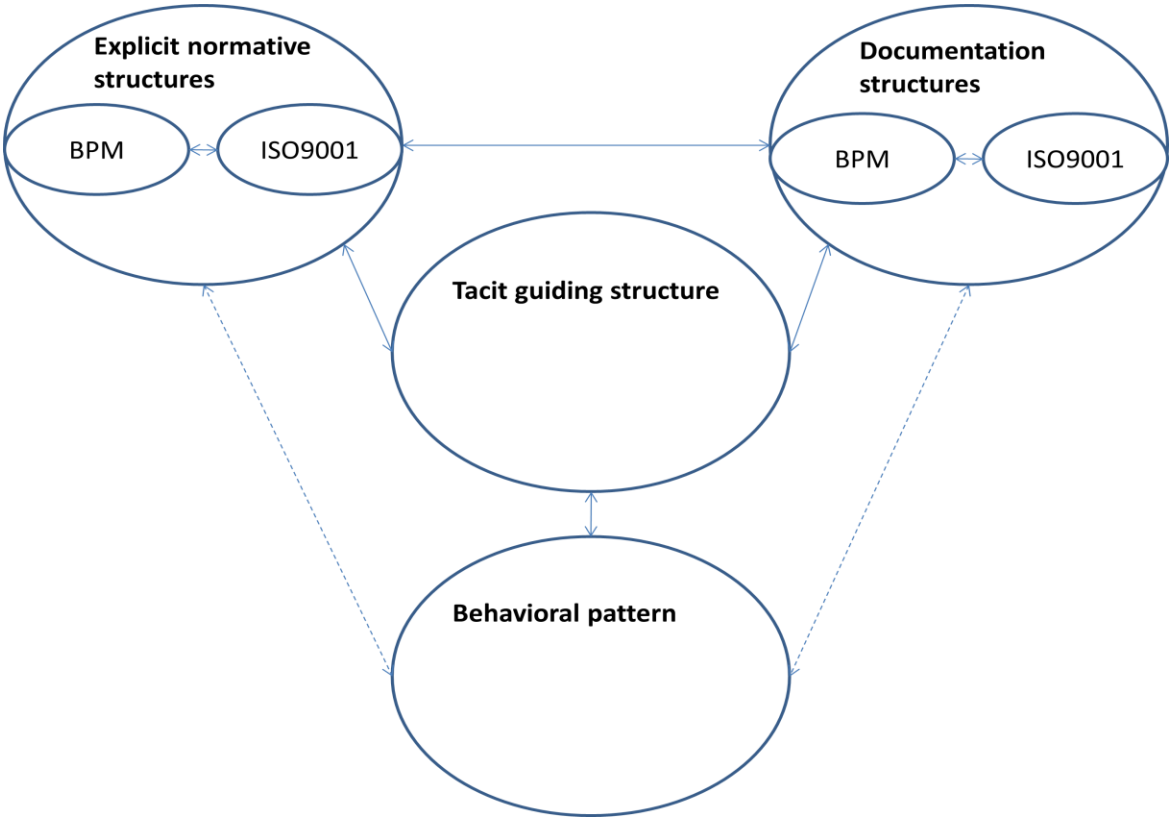


**Figure 10: Integration of ISO 9001 and BPM through the lens of the framework**

There should also be coordination between documentations of ISO and BPM. If we make the relationship between ISO and BPM clear we can ensure a clear and logical link between the documents that are created. In the BPM case the amount of documents produced will not be as much as ISO documents, it is estimated that process maps and descriptions are the most important documents related to BPM which are also important documents of ISO. Keeping them updated and equal for both systems are essential.

As was explained integrating ISO 9001 and BPM is very important. One proposition is to integrate and promote them together under the label of APM (Amadeus Process Management). This can be a package that is based on both ISO 9001 and BPM but at the same time should be specific for Amadeus. It is important not to name it as BPM and ISO 9001 package because different concepts emerge in the literature or the practical world and will get outdated after some years. By naming it something related to the company we can make sure that these concepts are well used in the company even after some years. Moreover, the important point here is that we can add methods and tools to the existing package and make it aligned with upcoming useful concepts.

In this integration it is important to use the methods and tools already established in the company. For example DMAIC is the promoted and used methodology for improvement projects. People are familiar with the acronym, its steps, and the tools that can be used in each step; there is common vocabulary around it. The head of BPM team explained that the methodology for improvement projects that will be promoted and introduced by BPM team might be different from DMAIC. Although other methodologies might have more benefits than DMAIC but an already used methodology that has created a common language can bring better results and people will be more open to it. As one interviewee explains it is always possible to borrow the tools that are used in other methodologies and integrate them to a common methodology in the company.

As some interviewees explained BPM, the way it is presented to Amadeus, is more appealing in the surface because it is presented by graphs, by nice words and it has attracted the attention of some senior managers. Therefore people in Amadeus will be more open to the package of ISO and BPM. This package should clarify the roles of each program (ISO 9001 and BPM) and should make it clear that how they are complimentary and how they are going to be applied together.

The integration that is based on the foundation of ISO is ideal and will be more accepted by people that have been trained on many tools and methods common in many quality programs. The only point that needs to be considered is to avoid thinking of ISO as a program for obtaining the certification. ISO should be used as a mean to get closer to Total Quality Management.

As was mentioned before, the AmaMeth initiative has been very successful and BPM can benchmark its success and also benefit from it in managing the improvement projects. As several interviewees explained, the BPM team should act as a center that provides support for other teams in improving their processes. BPM should simplify the improvement language and allow the community of practitioners in process management and improvement to share knowledge using common tools and templates. BPM can also act as a platform for best practice sharing.

## 7.2 Suggestions for future research

As mentioned before in Amadeus there are other quality programs such as CMMI. It is suggested to do a similar study in order to evaluate the role of ISO, BPM and other programs such as CMMI in relative to each other. The model presented in the chapter 3.1 supports the importance of such study as well since it is essential to link the different norms and their documentation. This will allow better integration of the norms to the tacit guiding structure and will enable coordination of the programs in order to prevent the duplication of work and silos.

In this research the data about the amount of BPM contribution to "mutually beneficial supplier relationships" principle of TQM were not collected. The consulting firms that provide human resources for Amadeus can be considered as strategic suppliers because human resources for a company are essential resources especially for a company such as Amadeus that very much depends on its employees to develop software programs. In future researches it would be useful to evaluate how much BPM can contribute to better relationship with this type of suppliers.

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# Appendix

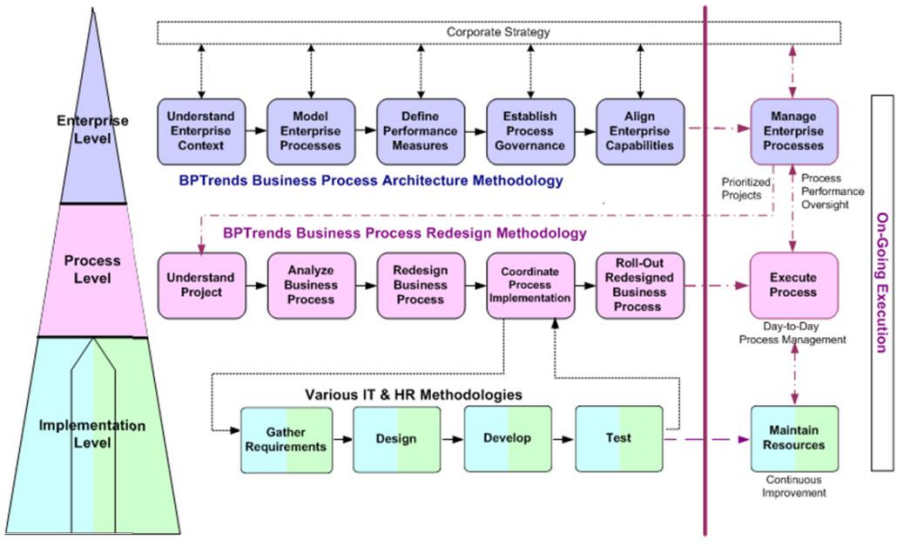
## Interview questions

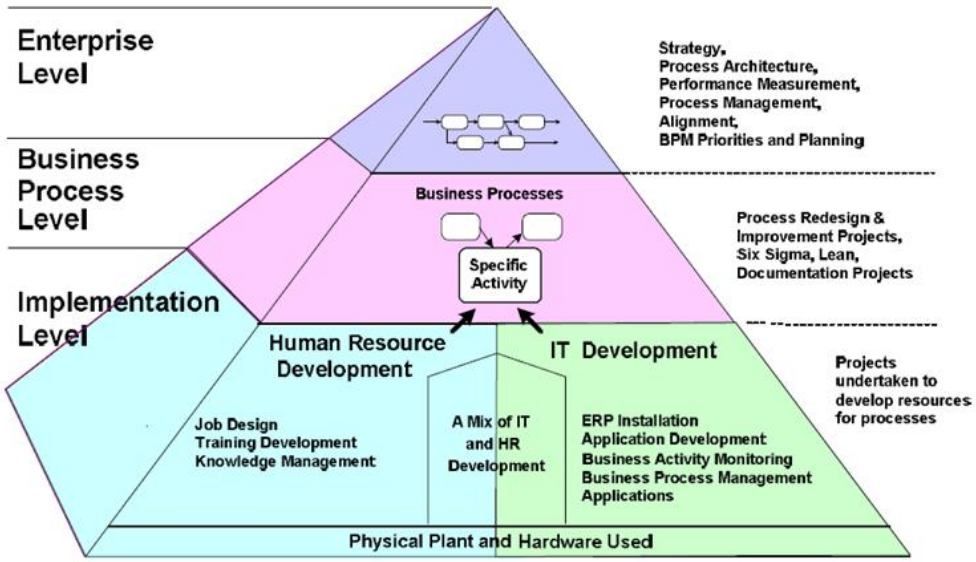
1. How do you define BPM and its objective?

The methodology that consultants have provided to Amadeus is shown in below pictures:

2. How do you interpret it?

**BPTA methodology**



3. What are ISO 9001 and its objective in your opinion?
4. Considering the BPM objective that you previously defined, how do you compare it with ISO objective?
5. Do they complement each other? If yes, how?
6. Can you relate ISO clauses to different elements of BPM?
7. Do you think there are some deficiencies in ISO 9001?
8. Do you think there are some deficiencies in BPM?
9. Can you think of areas that ISO lacks strength and BPM can make up for them?
10. Can you think of areas that BPM lacks strength and ISO can make up for them?
11. Can you think of areas that ISO has provided good foundation that can be useful in BPM and can make BPM implementation easier?
12. Do you think Amadeus should apply ISO and BPM together? If yes, why do you think so?
13. How do you evaluate Amadeus readiness for implementing BPM?
14. In your opinion are there challenges in implementing BPM in Amadeus? What are they?
15. Do you think that implementing BPM requires a specific culture?
16. Do you think Amadeus has this culture?

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