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A Total Quality Management Methodology for Universities

Jose C. Flores-Molina

Florida International University, jflor022@fiu.edu

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FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

A TOTAL QUALITY MANAGEMENT METHODOLOGY
FOR UNIVERSITIES

A dissertation submitted in partial fulfillment of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

in

INDUSTRIAL AND SYSTEMS ENGINEERING

by

José Carlos Flores-Molina

2011

To: Dean Amir Mirmiran
College of Engineering and Computing

This dissertation, written by José Carlos Flores-Molina, and entitled A Total Quality Management Methodology for Universities, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this dissertation and recommend that it be approved.

Shih-Ming Lee

Ronald Giachetti

Irtishad Ahmad

Chin-Sheng Chen, Major Professor

Date of Defense: March 24, 2011

The dissertation of José Carlos Flores-Molina is approved.

Dean Amir Mirmiran
College of Engineering and Computing

Interim Dean Kevin O'Shea
University Graduate School

Florida International University, 2011

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DEDICATION

I dedicate this dissertation to my wife Marlene and my children José Antonio and María Fernanda. Without their sacrifice, patience, understanding, and most of all love, the completion of this work would not have been possible.

I dedicate my doctoral studies to my parents Nelly and José, for their infinite love, sacrifice and vision to instill the loftiest values in me, which certainly paved the way towards higher education.

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I wish to thank the members of my committee for their support. Dr. Giachetti and Dr. Lee were very helpful and showed interest in my successful completion of my coursework and my doctoral studies. Dr. Shen was very cooperative in allowing me the use of resources for my research work. Finally, I would like to show my deepest gratitude to my major professor, Dr. Chin-Sheng Chen whose continued support, guidance and teachings in particular regarding the academic rigor of research were crucial towards the successful culmination of my doctoral studies.

ABSTRACT OF THE DISSERTATION
A TOTAL QUALITY MANAGEMENT METHODOLOGY FOR UNIVERSITIES

by

José Carlos Flores-Molina

Florida International University, 2011

Miami, Florida

Professor Chin-Sheng Chen, Major Professor

This research document is motivated by the need for a systemic, efficient quality improvement methodology at universities. There exists no methodology designed for a total quality management (TQM) program in a university. The main objective of this study is to develop a TQM Methodology that enables a university to efficiently develop an integral total quality improvement (TQM) Plan.

Current research focuses on the need of improving the quality of universities, the study of the perceived best quality universities, and the measurement of the quality of universities through rankings. There is no evidence of research on how to plan for an integral quality improvement initiative for the university as a whole, which is the main contribution of this study.

This research is built on various reference TQM models and criteria provided by ISO 9000, Baldrige and Six Sigma; and educational accreditation criteria found in ABET and SACS. The TQM methodology is proposed by following a seven-step meta-methodology. The proposed methodology guides the user to develop a TQM plan in five sequential phases: initiation, assessment, analysis, preparation and acceptance. Each

phase defines for the user its purpose, key activities, input requirements, controls, deliverables, and tools to use. The application of quality concepts in education and higher education is particular; since there are unique factors in education which ought to be considered. These factors shape the quality dimensions in a university and are the main inputs to the methodology.

The proposed TQM Methodology is used to guide the user to collect and transform appropriate inputs to a holistic TQM Plan, ready to be implemented by the university. Different input data will lead to a unique TQM plan for the specific university at the time. It may not necessarily transform the university into a world-class institution, but aims to strive for stakeholder-oriented improvements, leading to a better alignment with its mission and total quality advancement.

The proposed TQM methodology is validated in three steps. First, it is verified by going through a test activity as part of the meta-methodology. Secondly, the methodology is applied to a case university to develop a TQM plan. Lastly, the methodology and the TQM plan both are verified by an expert group consisting of TQM specialists and university administrators. The proposed TQM methodology is applicable to any university at all levels of advancement, regardless of changes in its long-term vision and short-term needs. It helps to assure the quality of a TQM plan, while making the process more systemic, efficient, and cost effective. This research establishes a framework with a solid foundation for extending the proposed TQM methodology into other industries.

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1 INTRODUCTION

1.1 Background and motivation

Quality is a concept as old as humanity itself. Historians have traced the concept back as far as the eleventh century B.C. in the Western Zhou Dynasty in Ancient China, when a system was setup to control the production of handicraft. The system consisted of a number of organizations, each of which was divided into five large departments, one being the department of supervision and examination (Juran, 1995). Another case can be traced back to Ancient Israel with examples from the Old Testament, written more than 2,500 years ago, with the Act of Creation, Inspection and Self-Control. Implementing self-control implies comparing and contrasting actual results with specifications; such a process is seen by God's daily inspection of His creation. When there was more than one creation, as on the third day, there were two acts of inspection. On the sixth and final day of creation, God completed his work and applied self-control to determine if more work was needed. The 31st verse of the book of Genesis reads: "*And God saw every thing that he had made, and, behold, it was very good. (Gen. 1:31)*", (Juran, 1995).

Frederick Taylor stated in 1911: "The inspector is responsible for the quality of the work, and both the workmen and the speed bosses must see that the work is finished to suit him. This man can, of course, do his work best if he is a master of the art of finishing work both well and quickly."

The concept of quality has evolved from process and quality control to quality assurance and management.

The Quality Movement led by Deming, Juran, Feigenbaum, Ishikawa, Crosby and Taguchi emerged prior to World War II. One of the main elements of this Movement was the concept of *Planning for Quality*, in other words, the achievement of greater quality levels as a result of an organized process of planning and implementation. The Deming or Shewhart cycle *Plan-Do-Check-Act*, *Deming's Fourteen Points* and the *Juran Trilogy* (that is, the three processes of quality planning, quality control and quality improvement) are the main pieces of the Quality Movement. Quality leading experts W.E. Deming and J.M. Juran were invited to Japan in 1950 and 1954 respectively, and they had high impact on Japanese business men, helping them in the pursuit of quality. The first concepts of quality were implemented in a manufacturing environment. The use of data and statistical quality control was soon spread to be studied in manufacturing environments. The seven quality tools taught by Ishikawa were mainly used at the shop floor level. Quality circles were successful, including engineers and operators. Feigenbaum coined the terms *Total Quality Control* and *Total Quality Management* as well as *Quality System*. He proposed to shift the concept of quality from the technical methods to a major business management strategy. Thus, quality extended to fields such as customer service, logistics, sales and marketing and service companies in general. The concepts evolved and were adapted to suit any kind of company for both manufacturing and services. ISO 9000, Baldrige, Six Sigma and Lean approaches spread through organizations. Later on, the scope of application was expanded to public institutions. Federal and local governments began the application of quality concepts and techniques to areas where profitability is related to social welfare. The concepts related to customers and clients also evolved including the term *stakeholders*, involving a wider focus on good performance, not only

for the customer of a company, process or product but for a set of customers and others that can be affected by the university actions, with a set of needs and demands.

Subsequently, the concepts were also embraced by the educational sector. The need for quality in the education environment is not new. The quality of teaching, quality in the classroom as well as quality in the teaching-learning process are areas where the use of quality concepts has also been discussed, jointly with the strong link between quality of education and its impact on the quality of life of a society. The Quality Movement is a new approach to quality and provides a new framework of study. The new quality concepts needed to be adapted for their application within the educational context since it has very particular elements.

Finally, these concepts reached the university. Universities are aware of quality and competitiveness in higher education, and the existence of accreditation, rankings, awards, benchmarking, national societies, as well as selection standardized processes such as SAT or GRE reflect, in Juran's words, *the proof of the need* (Juran, 1998) for quality improvement in universities. From the traditional intensive research universities to the newest smaller ones, the role of universities and higher education is essential for the development of the community where the stakeholders are.

As to the evolution of the concept of quality in universities, there is an increasing requirement of accountability from the stakeholders. The community increasingly requires that the university is also efficient in use of resources so as to achieve the best results possible.

The accreditation of institutions and programs is an example of all this. It represents a form of quality assurance by using state funds, research funds, grants, donations, and tuition fees, among others, all of them used properly.

From their early days, universities have always delivered quality services and have improved over the course of years. However, the improvement of quality has basically been intuitive. At present, there is no methodology that will allow a university to prepare a quality improvement plan (TQM Plan), to be used as a guide to a structured, organized and systemic organizational quality improvement effort. Consequently, it is necessary to develop a methodology that would allow any university to find a way to improve quality and thus, to accomplish its mission and contribute to society and stakeholders. No efficient process to prepare such TQM Plan has been developed yet nor a quality control of the plan has been implemented; the methodology will assume this. This methodology will be systematic, cost efficient and will ensure good quality. However, models and criteria do exist, but they can only be used as aspects to consider.

1.2 Problem description

In every sector and every industry there is a perception of quality. Universities are not the exception to this, since they are organizations that are not isolated from society but on the contrary, they are strongly linked to it. Such close relationship defines a role and a challenge that demands continuous improvement. Being the centerpiece of an educational system, universities improvement processes have a direct impact on the development of society itself.

During the first half of the twentieth century, especially prior to World War II, the Quality Movement was developed which proposed that quality was not only a state to inspect or a characteristic to measure, but it was the outcome of a planned effort and a systemic process that would result in the level of quality that the organization proposed to itself. This would be the level of quality to be offered and experienced by the recipient of the products; that is to say, the users and the stakeholders. This new quality approach is applicable to any organization, regardless of its size, industry, country or economic situation. These quality practices have been widely used for more than half a century (Wu, 2011); however, the question whether quality could be controlled (Shewhart, 1931) marked the beginning of the Quality Movement.

For universities, the quality concept is not new, and there has been a continuous discussion about the need for improving the quality of education (UNESCO, 2005). Efforts are being made to identify the characteristics of a world-class university and comparing them (Alden and Lin, 2004), to find benchmarks as a reference for quality improvement for any university regardless of its present quality level. However, there is no evidence of research on how to improve the quality of a university as an organization: what needs to be done, or how to organize and set up a program to improve the quality of a university. The lack of a methodology for implementing Total Quality Management in universities, does not allow organizing efficient and structured initiatives to improve quality. Models and sets of criteria for quality improvement and assurance are available; however, these focus on standardizing what needs to be done but do not describe how to do it. The same situation was already encountered and criticized by Deming and Juran

when they started the Quality Movement; they had to face a lack of a structured process of planning for quality.

Yet, the need for methodologies has never been strongly perceived. It seems as if methods are so much a part of what we do that they are taken for granted. Moreover, there has not been a methodology that provides for the development of methodologies. In the past, anyone who required developing a methodology simply depended on their intuitive understanding of methodologies and their creative abilities.

Currently, when it comes to quality in universities there are two main issues that arise: rankings and accreditation, in both cases quality measurements. There are several rankings that measure the quality of universities. A good measuring system that assesses both the overall quality of a university and the different facets a university has, is essential. It is the means by which it will be determined whether progress is being made or not in a quality improvement effort. In this regard, measuring quality will give us a good idea of what is important to care about, and therefore, which are the factors that have an impact on university quality; nevertheless, measuring quality as an isolated activity does not result in quality improvement. This study addresses the development of a TQM methodology to improve the total quality of a university.

1.3 Research objective

The main objective of this research is the development of a Total Quality Management methodology that will provide a tool for producing a total quality management plan for a university. The TQM Methodology will be developed using a

meta-methodology. The main deliverable of this study will be the TQM Methodology, which will be the roadmap to produce the TQM plan. This plan will be a partial deliverable.

1.4 Scope assumptions and constraints

The scope of the total quality management methodology is applicable to any university which aims at delivering high-quality undergraduate and graduate education as well as producing knowledge through research. Universities are unique institutions (Pollock and Cornford, 2004); however there is significant variability among them. Universities mainly provide three types of services: education, research and services (extension). The weights and emphasis of these three purposes vary among universities. However, this study focuses on the two main dimensions: producing graduates and generation of knowledge through research.

1.5 Significance (contribution) of the study

There is a lack of TQM methodologies to improve organizations as a whole. In the case of universities, accreditation systems and certification schemes, establish criteria to be met, and focus only on part of the university organization, and do not include any methodology. There is a need for a quality plan to include the university organization as a whole, and a methodology to follow.

Using the TQM Methodology should improve university quality and the efficiency of conducting TQM as well as saving time and cost assuring to implement TQM as intended.

Research focuses on the link needed between development of societies and a good educational system. Regarding the educational system, there is also research about the need of having high-quality universities and even world-class higher education institutions, to support the development of world-class institutions and enterprises in order to increase national and local competitiveness (Thomas, 2002). Even though, there is research related to the criteria to assess the quality level of universities and the characteristics of a world-class university as well as the development of national and international university rankings, there is no evidence of research on a methodology on how to improve the quality of a university in a structured way, rather than using intuitive approaches. Having a methodology will not only enable universities to follow a logical sequence to establish a planning effort for TQM, but it will also improve the efficiency and productivity of quality initiatives.

Furthermore, universities are the most important institutions where research is conducted (Aronowitz, 2000); however, in this case there is no evidence of research on this topic. This study aims at bridging the gap. The framework can be a good foundation for extending the use of the TQM Methodology to other industries.

This study aims at filling in the need for a methodology for the integral quality improvement of a university, and the operational definition of the methodology, which are the two main contributions.

1.6 Dissertation organization

Chapter 1 describes the background and motivation for this study, the problem description, the research objective, the scope assumptions and constraints, as well as the significance of the study.

Chapter 2 presents a review of the academic literature that addresses the problem under consideration, the need for quality improvement in universities, methodology concepts and definition, the concepts of Quality, Total Quality and Total Quality Management and its application to education and higher education.

Chapter 3 presents the solution approach and research plan, including the technical approach.

Chapter 4 explains in detail the Total Quality Management methodology.

Chapter 5 presents the application of the methodology, and how to use the tools.

Chapter 6 presents the validation and testing of the methodology.

Finally in Chapter 7, conclusions are drawn and future research is proposed.

2 LITERATURE REVIEW

2.1 Methodology definition and concepts

In this chapter the definition of methodology and related concepts are presented, in particular the difference between method and methodology.

2.1.1 Methodology definition

The Oxford dictionary (2010) defines methodology as, “a system of methods used in a particular area of study or activity.” The Collins English Dictionary (2009) defines methodology as “1. The system of methods and principles used in a particular discipline. 2. The branch of philosophy concerned with the science of method and procedure.”

Vogt (1999) defines methodology as the study of methods from its epistemological bases to problems of measurement. Webster’s (2009) defines methodology as the branch of philosophy that analyzes the principles and procedures of inquiry in a particular discipline.

It discusses the epistemological foundations of knowledge, the role of values, the idea of causation, the role of theory and its relationship to the empirical, the definition and validity or acceptability of the crop of reality, use and the role deduction and induction, issues of verification and falsification, and the content and scope of the application and interpretation (Sautu, 2005).

Related to research, methodology allows systematizing the methods by which research is conducted, in order to reach to more objective results, scientific research has been adopted. This type of research is a way of knowing, a common language of research.

Although it is not the only way to know, is said to be the most effective, because it is possible to learn through experience. Scientific research does not only allow knowing reality and assesses the ways of knowing, but it also improves the means of investigation (Manheim and Rich, 1946). Therefore, it is regarded as a self-correcting knowledge mode that is continuously developing (Manheim and Rich, 1946).

Scientific research is explicit, systematic and controlled. It is explicit because all the rules to define and analyze reality are clearly established. It is systematic because each test item is linked to another by reason or observation. It is controlled because the phenomena are analyzed to the extent possible, they are observed as rigorously as the state of knowledge allows (Manheim and Rich, 1946). The research process consists of six highly related but distinct stages: formulation of theory, operationalize the theory, selection of appropriate research techniques, behavioral observation, data analysis and interpretation of results (Manheim and Rich, 1946).

There are various methods such as the scientific method, the induction-deduction method, the analysis-synthesis method, the objective-subjective method as well as the static-dynamic method (Muñoz, 1998). According to the object of study it is possible to identify two main types of methodologies, one related to nature such as physics or chemistry and the other one related to human groups (such as social sciences, business sciences or human behavior).

In the interest of this dissertation, the operational methodology definition for this research is the means of stating a problem and developing a well-defined guide to solve this problem, including a purpose, sequential phases, key activities, deliverables, and

tools. Also methodology is defined as a means of stating a problem and also a well defined structured guide to solve this problem (Creswell et. al., 2003).

2.1.2 The search for knowledge through the method

To approach to the knowledge, first there must exist a well-known object in which the action of knowing ends, and an object knower who knows. The well-known object represents an idea and allows knowing (Darós, 2002). In the past, several authors have speculated about how to approach to the truth, to pure knowledge. However they realized that from our nature, it is possible to reach conscious knowledge, from performing other acts of knowledge, such as reflection on what is perceived (Darós, 2002).

Curiosity and necessity are the main reasons that have driven human interest to perform research, as it tries to understand the world around us in order to obtain greater knowledge, or to avoid or seek a solution to a problem. With either of the two purposes of our knowledge is in the acceptance of certain ways of improving what we find. Thus, as we learn more about our surroundings, we have more resources to act on it (Manheim and Rich, 1946).

Thus, man has been dedicated to develop, monitor and research in order to develop theory. The theories would be a set of hypothetical propositions, related concepts that provide a systematic view of phenomena, facts or events (Kerlinger, 2002).

On the other hand, science is the human activity that is about the attitude to observe and experiment in a particular order of knowledge (Colina, 2005), which are organized in a systematic manner by certain methods.

The contrast of the theoretical judgment versus the actual trial is conducted based on carefully selected methods and tools that will lead to an outcome in an investigation. In research, it will not be enough to perceive, it will be necessary to understand and explain in order to be able to predict (Kerlinger, 2002). The idea of knowledge raises two questions: how we know and how we should use what we know. The first question is related to the method, and the second to ethics and preference (Manheim and Rich, 1946).

To determine how we know it is necessary to establish certain rigorous standards with which we can define the reality we try to learn, a way of defining reality that is generally accepted, a common language of research, so that anyone with a similar background may easily understand the definition of it. Thus, if everyone agrees about how they learn, they will also agree what they know (Manheim and Rich, 1946).

To determine how to use what is known is a subjective and personal activity. We all have different perspectives and needs that lead us to favor a particular application of knowledge, and are not necessary to agree on it (Manheim and Rich, 1946).

The results of a research process are shown conceptions of reality or paradigm that the researcher has. In research, the objectives are translated into research questions formulated from the theory, i.e., are theoretical constructs around a theme or problem.

Research is a process whose steps are used to collect and analyze information and allows us to increase our knowledge about a topic. In general, research consists of three phases: proposing a question, collecting data to answer and presenting an answer to it (Creswell, 2005).

When researching it is possible to adopt two perspectives: an empirical or a normative. The first describes the reality and the second guides the implementation of

what has been learned about it. However, it is necessary to perform a balance between these two, since normative analysis without empirical basis can lead to the establishment of value judgments decoupled from reality. And the empirical analysis without sensitivity to the normative can lead to the grouping of observations that we are not prepared to understand (Manheim and Rich, 1946).

To research, methods are used, and about them it is said to constitute ways to facilitate the discovery of reliable knowledge to solve the problems we face. The method is a way of doing, especially a systematic one; it implies an orderly logical arrangement (usually in steps) (Webster's, 2009). Methods or modes of procedure are a series of steps that the researcher is in the process of producing a contribution to knowledge and provide guidelines for discovery (Deising, 1972).

In practice, for the use of a method there is a relative respect for the assumptions of the methodology that is framed, this relative respect is necessary to solve two major challenges that any method imposes: transforming the conjunction issue or problem and theory in research and objective questions, and translating the questions into procedures for the production of empirical evidence (Sautu, 2005).

Even though some methods are common to many sciences, each science has specific problems and questions, and therefore their own needs where it will be necessary to use those modalities of the general methods best suited to solving their specific problems. Thus, the method is not invented, but it depends on the object of investigation.

In particular, the method for obtaining scientific knowledge is a rigorous procedure of logical order, which aims at demonstrating the true value of certain

statements (Angeles and Münch, 2003). In the past the following definitions of the scientific method have been provided:

- Efi de Gortari (1980): abstraction of the activities that the researchers realize, focusing on the process of acquiring knowledge.
- Iglesias (1976): the method is the way, an order, connected directly to the objectivity of what you want to study. Methodological demonstrations always have a statement regarding the laws of human knowledge in general.
- Kerlinger (1981): systematic way in which thinking is implemented when researching, and has a reflective nature.
- De la Torre (1991): logical process of reasoning emerged from induction.
- Balseiro (1991): The general method of science is a procedure that applies to the entire scope of research within each issue of knowledge.

2.1.3 Method and Methodology

There is no consensus whether method and methodology are the same. Some authors use it interchangeably however others do not. Harding (1987) defines method as a technique for gathering evidence.” Method, more simply stated, helps the researcher find out what he wants to know (Bowles, 1983). The concept of methodology is much more philosophical and value-laden than that of method (King, 1994). Methodology is also introduced by Cook & Fonow (1986) as “the study of methods and not simply the specific techniques themselves.” Methodology is a complex and abstract concept (Cook & Fonow, 1986). It includes the choice of method, the impact of the choice and how these methods chosen are used (Campbell and Bunting, 1991). Thomann (1973) states

that there is a difference between methods and methodologies, since methods are rules or procedures that guide someone in accomplishing a purpose, these are “rules of thumb” or “guidelines.” On the other hand, methodologies are a series of operational steps that accomplish a specific definable purpose. The difference is that a methodology provides a specific well defined route that accomplishes the purpose, whereas the method provides one possible route that is not well defined (Thomann, 1973). For instance, the “Scientific method” does not meet the definition of methodology because it does not present a series of operational steps, but a general set of steps that only provides the user with the main steps in doing research.

2.1.4 Meta-methodology

The need to find solutions to problems or concerns in a field and a specific situation has led humans to develop ways to reach their goals and define routes or correct procedures to solve them, which have been consolidated as methods (Sierra, 2004). However, humans tend to review and improve the methods used to solve problems on an ongoing basis.

By analyzing the motivations of humans to continually improve the methods it is possible to identify that they respond to the nature of the method, since it is aimed at solving a problem type applied to a specific situation, it is a guide or guideline about how to proceed in certain situations (Thomann, 1973). When it does not apply to a particular matter or the procedures are questionable because they are not so specific, then new methods are raised. The main purpose of a meta-methodology is to support stakeholders in using their knowledge to reach to conclusions following a guided process.

This seems to suggest that there is a need to develop procedures that may be applicable to solve any type of problem, which would provide specific and sequential steps on how to act. Procedures with such characteristics are conceived by Thomann (1973) as methodologies.

Years ago, if someone wanted to develop a methodology just would rely on their intuition and creativity. At present, the development of methodologies has not endured because there is a lack of awareness of researchers about the need to create them, who perceive only that this is missing when they need to develop one. However, this need goes beyond the identification of a particular methodology, as it seeks to find a methodology to develop methodologies, also known as Meta-methodology.

Hutchinson and Thomann (1972) developed a Meta-methodology, which is composed of seven steps for developing a methodology. These steps are listed below:

1. State the purpose of the proposed methodology,
2. Test the purpose according to the following criteria: desirability, practicability, uniqueness, and operationability,
3. Analyze the implications of the purpose,
4. Operationalize the purpose,
5. Design procedures,
6. Test the procedures, and
7. Revise the purpose and the procedures, if necessary.

This study uses the postulates proposed by Hutchinson and Thomann (1972) to develop the methodology proposed, since this meta-methodology provides a framework

designed and intended methodology to develop a methodology. Additionally, to identify that the methodology has been successfully developed the following criteria will be considered, which were also defined by Thomann (1973), who identified three aspects to consider when developing the best methodology defined for a purpose, these are:

1. Determination of the purpose.
2. Development of the steps that make up the methodology, and
3. Testing of the methodology to see that it accomplishes the purpose.

2.2 Total Quality Management

The study of Total Quality Management is not new. Starting with quality, there is a body of knowledge that has been built, beginning with inspection, then to quality, quality assurance, quality management, Total Quality and currently Total Quality Management.

2.2.1 Quality

Quality is a word that we all have ever used to describe a particular product or service, either positively (e.g. "this product is high quality") or negatively (e.g. "that service quality is poor."). It is a seal-of-approval, a desire, or a goal to achieve. Everybody wants to acquire something well done, as perfect as possible and that is where the quality is meaningful and relevant to industry and organizations in general.

The concept of quality is broadly accepted and used in different fields such as manufacturing, marketing, and services such as health and education. Initially, the word quality was used only to refer to the level of excellence of products, an item was

considered of quality, as the characteristics and properties associated with their goal allowed it to be compared with others of the same species (Fernandez, 2005). Over the years, the word was covering various fields and becoming broadly used, entering the vocabulary of service companies, and even in health and education institutions.

The concept of quality is complex, and therefore individuals and groups may differ, and indeed they do, about the quality of a product, program or service. Moreover, the very perception of reality, the own scale of values, context and needs, among other factors; influence the demand for quality with various companies, institutions and individuals.

At the company level, the institutions compete among themselves about the quality of the product or service they offer, and yet their conceptions of quality can be different. For some companies, quality can be defined in quantitative terms (number of machines in the factory, number of students enrolled at a study center, number of operating laboratories, etc.), while for others, it would be based on qualitative criteria (e.g. customer satisfaction with the product or service provided).

The task of defining quality is a very complex assignment, and is even more difficult when one enters the field of education. In education a “product” is not referred to in the same way as it is in industry. In the field of education, it is about working with human beings, and customers are no longer individuals but society at large. Quality is a goal set repeatedly in the education policies of all countries, however, each country and each society has a different concept of education, and therefore of the concept of "quality education.”

Usually in the field of education, and social sciences in general, there is imprecision and ambiguity of terms which makes each individual, assign a different meaning to the term based on his or her experience and knowledge about the subject. As a result of this, everyone can make a personal interpretation of a term, which leads to difficulties in communication. Therefore, an institution should not plan or carry out actions to achieve quality without a clear definition of what constitutes it and without a consensual agreement among their members regarding its meaning.

Quality is understood as something that affects the nature of things, being commonly used as synonym for “good” or “excellent.” Therefore, the quality in an absolute sense refers to the excellence of the product or service. The daily quality definition usually refers to the intrinsic qualities of the product or service, excellence being conceived as the full possession of the characteristics that define it.

Following this definition, Juran (1997, 1999) believes that quality can be defined as the absence of flaws in products. Products consist of goods, software (computer programs and general information) and services (work performed for others). Quality is defined as the degree to which a set of inherent characteristics fulfills requirements (ISO 9000:2005).

In this study, the concept of quality mainly used will be the one in ISO 9000:2005 along with the concept of quality being a change of attitude in the organization centered in the internal and external customer. The term quality has several meanings, which vary according to contexts in which they apply and the objectives to be achieved. This situation has led to confusion in the use of the term. The term quality can vary according

to the criteria used, starting with the concepts and reference models that are used to define it.

After looking up the term “quality” in a dictionary for a more precise definition, it is found that the term is described as sets of attributes or properties relating to something or someone. Therefore, quality is defined as, "An essential and distinguishing attribute of something or someone”, or “a degree or grade of excellence or worth”, or “a characteristic apparent individual nature of something” (Webster’s, 2009). Quality is understood as a neutral term that does not involve value judgments and that it should be added a qualifier. We could say that a teaching material has good or bad quality. Quality is neutral in this sense, and it would correspond to the qualifying action (right or wrong, good or bad).

Second, it is found that it makes a reference to the quality and superiority or excellence, as a degree that expresses the goodness of a thing. This is an ambiguous term, and can be given a special different meaning. For example, focusing on education, and referring to quality education in the term quality there is an estimate of the goodness of education based on values and parameters.

After analyzing the definitions given by specialized books and technical papers which go beyond the generic definitions (Juran 1997, 1999; Seibold, 2000; Roccaro, 2003, Fernandez, 2005), we find concepts that can be grouped into various categories such as:

2.2.1.1 Definitions of quality based on criteria

Based on the criteria that the institutions establish to determine the quality of a product or service, it can be defined as the level of effectiveness, the level of efficiency or customer satisfaction.

For some, quality is a synonym of “effectiveness” and it is defined to the extent that the organization achieves the objectives it has set. However, regarding the level achieved of these objectives, since it is not enough to meet a number of poor objectives to assure quality (Stenhouse, 1984).

Under these circumstances, the term “efficiency” has been introduced in naming the achievement of objectives; that is achieving the objectives as well as optimizing the use of resources for this purpose, so that an adequate cost-benefit ratio is used. However, this definition of quality does not apply to educational objectives, since it seems to prioritize economic factors, at the expense of educational goals such as development of reflective thought, analysis and synthesis capability, socialization, among others, which should be achieved although this would involve an increased investment or expenditure of resources.

In relation to the definition, Juran (1997, 1999) defined quality as “the totality of characteristics of a product that meets customer needs and thus make it satisfying.” The characteristics of the product may take different forms such as agility, ease of maintenance, courtesy of service, etc. In this perspective the customer is an entity internal or external who has been impacted by a product. The internal customer is one who is a member of the company (or institution) that produces the product. Among the external customers are those who buy the product, the regulatory bodies of government, the

general public, and so on. Furthermore, internal customers are those businesses or departments that receive supplies from any department within the same company.

2.2.1.2 Definitions of quality from the initial conceptions

The term quality can also change from one institution to another, depending on the different initial conceptions they have. There is a wide diversity of initial conceptions or ways of viewing the same product or service. That is, depending on how you define a good or bad service is to be determined the functionality and expected results thereof. However, it is possible that there are different understandings of the same good or service and is not possible to determine which is best. As a result, this issue is defined through the establishment of criteria or indicators.

For example, if for a textile company the most important fabric characteristic is its durability, then its efforts will be devoted to developing a product of maximum length at the expense of aesthetics or fashion. Its quality criterion is determined by the duration of the product. However, suppose for a company in the same industry the quality of a fabric can be defined by the economy of its production and the level of demand it has. Then, it will be devoted to cost savings and develop and produce products that will continue the established for fashion, perhaps producing a product not so durable, using the cheapest raw materials, but following the pattern set by fashion and in great demand.

2.2.1.3 Definitions of quality from the reference models

Finally, another aspect that influences the definition of quality is the benchmarks. At this point it is important to note that the models can be geared to different functions,

some point to the certification and accreditation and others to continuous improvement, which causes major differences between them.

The accreditation system is related to quality assurance, which discusses the entire process of production of goods or services. In the Encyclopedia of Quality: Terms and Concepts (Coartadas & Woods, 1995) accreditation is defined as a formal process by which an organization assesses and issues a certificate (called "Accrediting organization's stamp") approval processes and transactions undertaken by the organization or the skills of an individual.

In 1947 the International Organization for Standardization (ISO) was created, which has published since 1987 international standards to standardize the techniques and activities that take place in order to achieve quality management and quality assurance. The ISO 9000 series are generic standards that deliver generic principles that apply to companies providing services and manufacturing companies or industrial. These are standards on Total Quality Management issues, considering human factors as well as the production process. We also have the American Society for Quality (ASQ), leader as a professional society providing several resources such as books, journals, training, certification networking, among other services. These institutions often view quality as the set of properties and characteristics of a product or service that bear on its ability to satisfy stated or implied needs (ISO, 2008).

For Ruiz (1999), accreditation can control through evaluation, enabling the orientation of the demand and control the offer of services. It also contributes to society as a whole as it allows institutions to assume a value internally as the "accountability" about the internal conditions of their operations and their results. The accreditation

underpins a balance between the demands of autonomy of the institutions and control and surveillance to be exercised by the State or civil society.

To better understand the difference between accreditation and continuous improvement we can analyze the following case. A company can be recognized as a quality organization when it achieves ISO 9001 certification, where a private institution (registrar) issues a record of the adequacy of processes and production systems. There are companies which use the certification only as a marketing strategy so as to be considered in the market as quality companies. Moreover, in the educational field there is a similar situation with some universities that include such information in their advertising campaigns.

Instead, there are other institutions or companies who could conceive quality as a process, looking at both continuous improvement and not only the result of an external evaluation at a particular time

2.2.1.4 Minimum quality standards

Whilst there are various concepts of quality, many authors have agreed to identify certain conditions or minimum standards of quality that products and / or services must meet to be considered of quality (Fernandez, 2005). Among them:

- a) The involvement and commitment of all personnel of the organization, together with the elements of recognition, motivation, training, promotion, sense of belonging, in other words, satisfaction in the workplace.

b) The extension of quality to all elements of the process, both those that may be considered critical for the production of goods or services as those that facilitate the effectiveness and efficiency in production.

c) The implementation of quality at all times of the process, from conceptualization and design to its delivery and monitoring, through its design and development.

Having reviewed some general concepts of quality, its particular characteristics and some important aspects to achieve it, then we shall refer in greater depth to quality applied to some educational field. While quality is an important concept in every institution, and how to apply to conceive will differ according to type of institution, its objectives and the population which seeks to satisfy. It is important to recognize these differences in order to appropriately apply the concept of quality and to obtain results of such implementation that are satisfactory for all the parties involved in the process.

Specifically, Total Quality Management (TQM) is a management philosophy that seeks to integrate all organizational functions (marketing, finance, design, engineering, production, customer service, etc.) to focus on meeting customer needs and organizational objectives.

In this dissertation, TQM is defined as a management approach focusing on managing the organization to meet and exceed customer needs, and involving all the processes, resources and mainly people in the company, towards achieving organizational objectives.

2.2.2 Total Quality (TQ)

During the 1990's it has entered the business world a new concept of "quality" called "total quality." This concept emerged in the postwar period as a requirement to raise quality standards governing the production of goods and services in the 1930s, with the objective of satisfying increased demand from consumers. Armand V. Feigenbaum was the one who originally used the term "Total Quality" (Huggins, 1998), and it was afterwards promoted by Walter Edwards Deming. During the fifties, Deming went to Japan and observed the development of Japanese companies in the implementation of innovations for the management of production processes, with wide participation of staff and ensuring customer satisfaction.

The characteristics that frame the concept of Total Quality are conceived from a perspective of globalization. In this conception, the quality must be present at all stages of the process, among which innovation and research are included (Fernandez, 2005). Innovation refers to changing the current status of a service or product through the introduction of innovative conditions or features. To carry out this innovation, research is needed both prior to innovation, through a needs analysis to identify the as-is situation and the needs of the population, as well as afterwards, through an evaluation or impact research.

Total Quality is a quite novel concept with particular properties. The first characteristic or goal emphasizes the fact that total quality can be achieved at low costs and high income. Second, is customer satisfaction, with its explicit and implicit demands. Similarly, total quality has the goal of continuous improvement through total quality management (Juran, 1997). This process should involve all staff in the organization and

all departments. It is no longer, as traditionally was, a specific “quality department” of the company, but it is expected to involve all of its employees. Nowadays, everyone starting from the CEO all the way down to the last employee in rank, are involved in quality improvement, for which they should take on a leadership role supported by growing competition and motivation. The optimization of company performance requires a more intense teamwork between the senior management and functional departments, and within functional departments themselves. These new roles require ongoing staff training, their linkage with the objectives and goals of the business and their professional development (Carrasco, 2007).

Finally, the total quality concept also implies the commitment of employees, which requires a continuous process of evaluation and adaption to the changing environment, where leadership in management teams and efficient management are crucial. This requires, in turn, a system of prompt and efficient communication between all members of the institution. The goals of Total Quality are shown in Figure 1 (J. Juran, 1999).

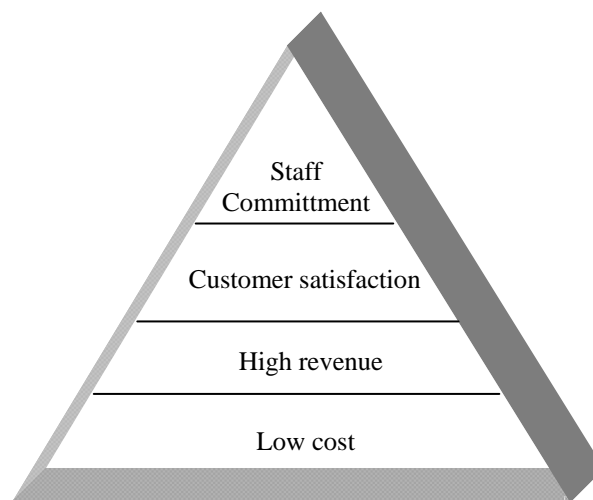


Figure 1: Goals of Total Quality (Juran, 1999)

It should be noted that the assumption of a quality management system involves certain disadvantages, for example, increasing the workload of the senior management. Also, the autonomy that it was previously enjoyed by the various divisions and departments within the company can be threatened. Moreover, the company also needs to establish a high-level (for example, a Quality Steering Committee) to coordinate the activities and business processes. It is also necessary to establish the organizational structure necessary to prepare the budget and reporting on quality.

2.2.3 Total Quality Management (TQM)

From that experience of Total Quality, Deming coined the term Total Quality that was first adopted by Americans and Japanese, then from the 1980s, by the Europeans. Today the term used by Americans to refer to Total Quality is "Total Quality Management" (TQM), while the Japanese use the name Total Quality Control (TQC) to denote the same concept. For other authors, quality is related to the satisfaction of the recipients or customers, or also called Total Quality Management (Carrasco, 2007).

TQM is both a philosophy and a set of guiding principles that are the foundation of a continuously improving organization. The four essential elements of all definitions of TQM are continuous process improvement, people orientation, quantitative methods, and customer focus. Total in this context means the involvement of everyone and everything in the organization in a continuous improvement effort. Quality is total customer satisfaction. The customer is everyone who is affected by the product and is defined in two ways: the customer as the ultimate user of the product known as the external customer, and the customer as the next process in the organization, known as the

internal customer; TQM focuses on satisfying both. Management should be understood as the leadership of an organization that creates and maintains a TQM environment (Saylor, 1992). Managers are the leaders of this initiative.

2.3. Total Quality Management (TQM) in Higher Education

The concept of TQM is adapted to the education and higher education environment.

2.3.1 Quality in Education

The concept of quality of education is relatively recent in the pedagogical literature. Through history, especially since the eighteenth century, improvements in education have been made, but many of these changes have lacked continuity and proposals have only been pilot plans, mainly due to education policies. These changes in education have sought to cover not only quantitative criteria (number of students benefiting, more schools, etc.), but also qualitative aspects have been considered to enable improving levels of education adapted to the new demands of society. Improving education should cover both aspects.

Since World War II, developed countries had a good educational infrastructure for the entire population, and a movement to promote a qualitative improvement in education considering the new challenges of society was started. This made possible to achieve “quality in education” as pedagogical literature and in scientific policies called it. However, although the term had been coined, it lacked a unifying concept. What is

understood by quality in education? This question identifies the main problem, a situation that is discussed even today.

The quest for excellence, highest level of quality is inherent in the educational field, whose nature is to be perfectible. Nobody can object quality as an objective of a project, a timetable or an institution. We all want quality educational institutions, and yet the problem arises when trying to define what constitutes quality in education, a relative and multidimensional concept, fully framed on the institutional model it has (Ruiz, 1999).

Currently, in many institutions, mainly in developing countries are still using the traditional notion of quality in education. It considers quality as the result of the introduction of broad content in curriculum and best teaching methods (Seibold, 2000). This type of reductionism is, in naively, that with a simple modification to the curricular plan or pedagogical practices are going to have better results, and therefore, are going to achieve high educational quality. This orientation is linked to assessments with strong reductionist connotations, focusing on the outcomes only at a cognitive level, ignoring other dimensions of human knowledge linked to knowledge to value, knowledge to decide, know-how and know how to act, which also affect the pillars of education.

These quality assessments, in general, do not reach the desired external results, such as the insertion of the student into society, in their family life, local life, in the workplace or the sense of citizenship. Nor have there been impact assessments at social and cultural level, ignoring the importance of culture in school and trying candidly to decouple from it.

The "Delors Report" (UNESCO, 1996), stressed that education is based on four pillars of learning: learning to know, learning to do, learning to live together, and

learning to be, recognizing that the quality of education is not a result of the achievements of excellence at only one area. This made the traditional concept of quality in education to be set aside and to choose other more elaborate concepts.

2.3.1.1 Approaches to the term "quality in education"

The concept of quality varies depending on how education is understood and the objectives it is pursuing. Similarly, each member of the education community and the various stakeholders in education, have different criteria to name an educational institution as a quality organization, complicating its definition even more.

The quality of education is, in fact, the guidance of any change. Therefore, when initiating any educational reform process, it should be clarified what is meant and understood by quality of education and must specify where it will lead to the actors in the system.

However, different definitions or conceptions of education are found, even in the same institution or organization. Some consider that a quality school is one that selects the most capable students, to facilitate a more uniform and intensive development of their potentialities. Others, however, appreciate having more heterogeneous students, making the institution to be able to adapt to the different student rates of learning. This is repeated in the various quality indicators, which can be seen conflicting views but with positions based on logical and coherent frameworks.

The concept of quality from the point of view of the key actors of the school (teachers, parents and mainly students) is highly variable and subjective, responding to

very personal interest that show customer and teacher satisfaction with a product, difficult to quantify in universal terms.

To better demonstrate this, Alvarez (2001) draws on research carried out by Uria (1991), which reflects the different conceptions they have about the educational quality of teachers, parents and students.

From the results of that research it can be stated that teachers understand the quality of education as the capacity offered by top management or institution to participate in areas that interest them and create the structures that will facilitate and make the job easier. From the academic point of view it is considered as quality the high levels of success achieved by students in their courses. For most teachers, quality is the correct behavior of students in the classroom and success in achieving the minimum targets, expressing what ordinary citizens should know to access a higher level in the educational system.

To sum up quality is for many teachers: few students per class in order to explain the topics; quality means more time to prepare classes and fewer classroom hours to enable it to intervene in the classroom in a more restful way; also though for a smaller group, quality means a climate that facilitates teamwork with colleagues.

Meanwhile, parents evaluated the school in terms of indicators related to dealing with teachers and authorities, the order and cleanliness of the infrastructure, the services offered by the educational center and the academic success or failure of their children, understood this in a personal way.

Students in turn define the quality in an arbitrary way. For them, the quality indicators they identified are: how easy it is to deal with teachers, the amount of leisure

hours, holiday and sports offered by the center, the climate of positive interaction and the ability to make friends at a school, the amount of work required, the ease with which a course is passed or a student is suspended, the climate of orderly coexistence, and so on. These indicators may vary according to the educational level of the educational institution either school, university or institute.

From this variable conceptual framework, some authors have tried to define what quality in education is, and have defined some of its components. Schmelkes (1994) describes the characteristics of the education of quality with five essential components:

2.3.1.1.1 Relevant or pertinent learning:

It refers to the ability of the institution or program to meet the needs of the environment and transform the context in which it operates.

Quality educational programs are those that include valuable and useful contents. These contents must meet the requirements needed to educate the whole student and to prepare excellent professionals considering social needs and should provide valuable tools for the job and the integration of the individual to society.

2.3.1.1.2 Effectiveness

This refers to the consistency between purpose, objectives and results achieved. Effective quality education, shall achieve the goals and targets set with all students. In other words, in the education field we can say that quality is achieved if a student learns what they are supposed to learn. This component is closely related to dropout rates at school or university.

2.3.1.1.3 Efficiency:

This aspect refers to resources and the processes involved in education. It is a measure of how adequate is the use of means available to the institution or program to achieve the purposes intended, "do well with less cost." The education received must be efficient, i.e. it must have the necessary resources and use them efficiently for optimal results. Within this component incorporates the problems related to repetition in different subjects or courses and low levels of learning.

2.3.1.1.4 Equity:

States the sense of justice in which it operates, by addressing the requirements arising from the social service nature of education, as non-discrimination, recognition of differences and acceptance of diverse cultures. It refers to the need to serve the students taking into account their individual differences. Quality education should not be regarded as a privilege of a few. Under this approach, Harvey and Green (in Ruiz, 1999) include another important component to consider:

2.3.1.1.5 Integrity:

It is up to the possibility or ethical sense of the institution in fulfilling its duties, and implies respect for the values adopted as such by the same institution.

Any effort or strategy to increase the quality of education and teaching in particular, depends on the ability to harmoniously integrate the various components involved in all educational activities including ethical processes.

Moreover, Ruiz (1999) notes that the quality of university education, represents a commitment to excellence of service provided to society and the student. This

commitment is linked closely with the mission of the institution, with teaching, research, university extension, with professional performance, with the governance, with the layout of the various components and resources to achieve the desired results. From the perspective of the whole school, as an organizational system, the achievement of quality is determined by both individual actions and by the interaction of individuals with their organizational unit. It is therefore a reductionist approach to assess quality through only the evaluation of its actors.

Some authors define the quality of education as a system of multiple coherences. This position is based on the idea that it is not possible to reach agreement on the nature of a quality education regardless of all the actors involved:

"...the different value systems, cultures, ideologies, attitudes and interests of groups or individuals, will be screened in as many characterizations of quality education. This means that, under these assumptions, the concept of quality could be applied to very different forms of education "(De la Orden, 1988).

With regard to multiple coherences system is expected to:

- Coherence between findings and purposes: *functionality*.
- Coherence between results and goals and objectives: *efficacy and effectiveness*.
- Coherence between processes and means and outcomes: *efficiency*.

The author also notes that the quality of education is a continuum whose points represent different combinations of functionality, effectiveness and efficiency are highly correlated and its maximum degree, which is excellence, represents an optimal level of coherence between all components of the system.

2.3.1.2 Dimensions of the term quality in education

As the term quality is a complex reality, it is possible to decompose it in dimensions. Roccaro (2003) presents six different dimensions of the concept as applied to education

Dimension 1: Academic disciplines

The quality is related to excellence in knowledge. To recognize it is important to establish standards which are defined by experts.

Dimension 2: The prestige

Prestige is a synonym of fame, good or bad, which people or institutions have, with regard to their morality or values. In other words, reputation is a matter of opinion, which is built on the basis of varied elements and can be lost when there is a relaxation in internal demand levels of the organizations or persons.

Dimension 3: Perfection or consistency

This is one of the dimensions most commonly accepted within the definitions of quality. We say that something is of quality when it has been realized with high levels of perfection from clearly defined specifications.

Perfection in performance is most valuable when done in the first time with zero defects, because this represents significantly lower costs and demonstrates a high level of proficiency of the necessary processes.

Dimension 4: Economy or results

Quality has an economic component to be distinguished in which the existence of resources, the use thereof and the results achieved.

The concept of the service or product will do that, the important would be the economic performance or the component of "value added", which in areas such as education or healthcare is often of great importance.

Dimension 5: Satisfaction

Satisfaction refers to the comfort of those involved, from those involved in the design, provision and improvement of the product or service to customers, users or beneficiaries of both immediate and medium to long term.

Dimension 6: Organization

This dimension has to do with the organization's ability to meet the increasing and more complex demands, which raise both its staff and recipients, especially when responding to these demands the organization enters into competition with others that provide the same products or services.

OECD presented in 2005 the fact that quality of education has become in recent years the main objective of most developed countries. It also identifies ten characteristics for effective schools that these developed countries have taken account, as detailed below:

1. Commitment to standards and objectives are clearly defined and agreed.
2. Participatory planning, which includes a joint decision-making and teamwork oriented towards innovation and evaluation.
3. A dynamic directionality to make and develop improvement.
4. Staff stability.
5. A strategy for lifelong learning and staff development requirements for each school and the context.

6. The implementation of a carefully developed curriculum and coordinated to allow each student to acquire the knowledge and skills essential or basic.
7. A large participation of the education community.
8. The recognition of the values of the school and adherence to these values.
9. A maximum exploitation of school time (basically aimed at schools).
10. The dynamic and robust support from education authorities and competent.

2.3.1.3 Aspects related to quality in education

There are three factors that influence the conformation of the educational quality of an institution: the socio-cultural, institutional/organizational and teaching-pedagogical (Carrasco, 2007).

2.3.1.3.1 The socio-cultural factor

Without knowing the context in which an educational institution develops and projects to society it is impossible to analyze the quality of an educational institution. The socio-cultural context defines limits and directs the intention with which an institution works. It is said that only when the educational institution responds to its context, the situation of it, and their interests and needs, and from there develops strategies to improve or transform that reality, only in that extent you can define in part whether the institution is of Quality (Riveros, 2009). It will be based on the socio-cultural context that the institution must identify educational needs, available resources and defining institutional goals.

2.3.1.3.2 The institutional/organizational factor

Several studies have shown that the way an educational institution is organized, from the distribution of spaces, the appropriate use of its resources, the way human talent is distributed; are elements that influence the educational process while not is determinant for the educational quality (Inga, 2006). Instead, they say that processes, understood as the intentional interaction between people and authorities of the educational community from their roles and functions, are what determine the quality of the institution. Thus, the interrelation of management of processes, teaching, learning, building citizenship and community outreach is committed to build educational institutions of quality (Riveros, 2009).

This factor considers specific curricular objectives raised by the educational institution, as well as the allocation of curricular media, and technological and financial resources, the selection of students and faculty, buildings and facilities. It also sets out the teaching and learning processes of the courses, smooth academic information flows, bureaucratic management, management of organizational climate, intervention on classroom environment and control of operations (Inga, 2006).

2.3.1.3.3 The teaching-pedagogical factor

The quality of teaching-learning process is not only related to the proper presentation of content by teachers or teaching strategies they use. The quality of teaching is mainly related to the quality assurance of student learning. Under this conception, it is necessary to focus on what students are learning (content, skills,

strategies, values, metacognitive skills, etc.), how they are learning and how these aspects of learning could be improved.

With regard to the quality of the learning process, it is associated with the quality of the construction of meanings, but not reproduction of contents. One way of measuring the quality of education is related to levels of learning that students achieve from the instruction. Research (Monereo 1998, Beltran, 1996) point out that students, by interacting with instructional materials, achieved varying levels of understanding ranging from superficial understanding, to the deep understanding of the material, depending on the mode of approach to it.

In this sense, a superficial approach to the material occurs when the student is interested in replicating what is on the material for the purpose of responding to demands imposed from outside such as the questions set by the teacher, to summarize, among others. In this process, the strategies used by students will be more geared towards memorizing.

On the other hand, a deep approach to the instructional materials will be defined by the objective of understanding the information presented. To that end, the student will apply strategies such as giving meaning pertaining to information presented in the material.

Making a comparison between the two forms of action, the second strategy will result in higher quality outcomes in learning. Under this premise, low-quality learning is characterized by the absence in the establishment of relations between the student's prior learning and new information. When new information is not integrated into the previous

one, i.e. when it remains in isolation, the length of it will be short and will be lost more easily.

From this information, it can be established that the course (considered as a whole, in other words, taking into account the way it has been designed, the way it is taught and evaluated) is related to the quality of learning.. Then the quality of teaching in higher education has to do with each of these aspects (Martens and Prosser, 1998).

According to this view, the quality of the teaching is related to the following:

- With contextualized teaching and continuous improvement.
- From this view of quality is necessary for universities to ensure that their educational systems are sufficiently open and flexible to changes that may occur with respect to disciplines, years of study, required and elective courses.
- It is important that universities consider that the results obtained from the ways and means used to improve the teaching-learning process are uncertain; in that sense it is necessary to be continually focused on improvement.
- Any system of quality assurance of the teaching-learning process, which starts from the fact that the quality of teaching depends on the level of quality of learning that students achieve, it must be taken into account the three aspects described above. This is the case of systems based on the evaluation of the learning by students.

Instructors

The faculty member, instructor, professor, or teacher, is undoubtedly the great architect and guide of a teaching of quality. However, the teacher is not an abstract entity

working in isolation but develops under temporary conditions, ideological, and a given training. We must therefore take into account our tendency to blame instructors for all the ills of the educational system because it may be all of them responsible in the end for the way they teach (Cano, 1998).

On this conception, we can find statements indicating that the quality assurance of education only depends upon the teachers or professors and therefore believe that improving quality must be associated with:

- Rigorous selection procedures, which allow selecting only talented and highly motivated candidates.
- A brief initial education and practice-based.
- Motivating salary, enough to avoid brain drain to other institutions or professions (in the case of school teachers).
- Professional development plans.
- An administration that offers opportunities for promotion.
- Teacher stability.
- Teamwork and shared decision-making.
- Planning and coordinating curriculum.
- High degree of autonomy.
- Instruction assessment.
- Continuing education and desire to improve.

However, it seems that the issue of lifelong learning, even today is considered the most influential of all the above. Options for lifelong learning should be considered, but

we must discuss the procedures that have been structured, the times available and the implications this formal teaching training has.

Following this perspective, Carrasco (2007) recognizes the important role of teachers in educational quality and identifies five tasks to be achieved to successfully attain this goal:

2.3.1.3.3.1 Reflection on teaching practice

The teacher should be very clear about what they consider most important in education and what their role in it is. This reflection will help target their work and redefine the goals you want your students to achieve.

The work of the teacher does not finish when their class finishes, they must prepare the lectures, grade papers and exams, etc. Therefore, the educational institution should help teachers carry out their duties, including spaces for planning and assessment of the teachers' work, not from a perspective of sanctions but to offer feedback and implement corrective actions.

2.3.1.3.3.2 Transferring of an excelling discipline

One of the most important tasks of the teacher to educate their students on values and virtues, however, most teachers spend most of their time to cover theoretical contents. The teacher can improve the quality of education, if he seeks the transfer of self-imposed standards of excellence and forming in students a self-demanding attitude and independence. The creativity of each teacher, would allow him to have an innovative approach, for students to be progressively demanding better results in the acquisition of relevant learning, in their development of skills, and the assimilation of values.

2.3.1.3.3.3 Warmth in the relationship with their students

It highlights the relationship established between teacher and student and defines the quality of education in terms of human quality of that relationship. Educational processes are held within a social framework, therefore if you improve the classroom environment, you're creating favorable conditions for the acquisition of significant learning. The teacher can create this training environment if you try to approach students and listen, if he is open to the extracurricular, to the unexpected, the subjectivity and creativity.

2.3.1.3.3.4 Promoting teamwork within their institution

The teacher alone cannot significantly raise the quality of education offered to students. It is important to conduct a multidisciplinary work of teachers in order to achieve this goal. Teamwork is more than just making decisions jointly and acting accordingly to achieve a common goal; teamwork implies taking responsibility for each other, monitoring the process, and assessing together the results of the decisions made. However, the organization of most educational institutions does not facilitate this work environment, having no team meeting space, limiting the time of teachers to deliver courses.

2.3.1.3.3.5 Promotion of social participation in the educational process

The school or higher educational institutions are not solely responsible for the education of individuals, parents, peer groups, media, cultural and religious institutions also exert a notable influence on new generations. Therefore, teachers must create spaces

for social participation at the micro level (school and family) and macro level (society in general).

Alvarado, Angeles and Espinoza (2006) include two more activities which the instructor must perform to improve quality of education:

2.3.1.3.3.6 Define your role within the school and the curriculum

If the teacher knows what his mission is as a teacher and what his institution expects from him, then he will be able to better accomplish its task. If he also has a very clear understanding of what is the graduate profile of a student who is training and how it contributes to it with the subjects that is responsible for, then he may be more efficient in his work.

2.3.1.3.3.7 Familiarity with their discipline and stay updated

This is a condition without which no one can give a good lecture. If the knowledge a professor possesses is not sufficient, he cannot efficiently teach or guide his students in their learning. Also, even though the teacher is usually busy, he must devote time to train and stay updated.

Finally, Cano (1998) bases the quality of education in the faculty and its action involves assigning all the responsibility of the education system in them. Perhaps that is why the education system is often judged on the evaluation of schools and teachers, regardless of the conditions under which it operates. This undoubtedly represents many dangers.

Students

Students are the “raison d'être” of any educational institution. The effort to improve quality has as the ultimate recipient the students. It is them who ultimately have to be benefited by the improved functioning of schools. What you are trying to achieve is that the students, all students, and according to their potential, learn more and better, learn to learn for themselves, develop a taste for the study, the desire to know more, and gradually reach personal maturity, social and moral to allow them to act responsibly and autonomously (Ministry of Education of Spain, 1994).

To achieve all these ideals, especially in the field of higher education, is necessary to have a capable group of students with potential.

However, by focusing on the student runs the risk of just evaluating the results it reaches. Faced with this danger Schmeller in 1992 (Cano, 1998) notes that while one can accept that the goal of any movement for excellence is to improve learning outcomes of all students, it is the process that produces these results and thus, a movement towards quality seeks to improve the process that leads to results and is not the other way.

2.3.2 TQM in Education

Many schools have adopted the total quality concept, where society is seen as a customer and there is a need to know the views of interested parties regarding the service provided. Therefore a school can be conceived as a service company that produces education on some students, applying a teaching-learning process and getting the particular services (product education, academic performance, etc..), which to do this has some requirements and specifications (courses, curriculum, resources), facilities and

means (classrooms, laboratories, textbooks, books, etc.), process controls (exercises, exams, etc.), and a verification of final results.

However, this concept brings a lot of distrust in the educational field, due to the creation origin of businesses and enterprises. Thus, for Seibold (2000), despite the fact that a business or corporate model could contribute to the educational model, by no means can it include the ultimate principles underlying a customized model of education management.

In the model of total quality education, the focus is placed on the recipient of the educational activity, which is primarily the learner -called "beneficiary" - which plays the role of "customer" in the business. Such a learner-centered position is coincident with the progress of the new pedagogy, which has displaced the importance that once had the contents and teachers once had and now focuses on the student, but without neglecting the role of the teacher or the educational content.

From this view, reforms are continuous in nature and must be carried out consistently by all the educational community. Bradley (Cano, 1998) indicates that any school that wishes to attain total quality must have the following characteristics:

- Maintain a clear and shared vision of what students should learn.
- Implement cooperative learning strategies at all levels.
- Having a sense to change the vision to support its mission through a strategic development plan for the educational institution.
- Teaming up with other social, educational, political and economic actors.
- Having a vision for development, built by all representatives of the educational community.

- Develop action plans to help implement the process of continuous improvement of the institution.
- Promote and support innovation.
- Identify personal skills and knowledge required by the team to carry out the program of development of the school and provide opportunities for the institution to engage in professional development process.
- Provide ongoing training plans for all the staff.
- Conceive the students as active learners who strive to learn.
- Understand the role of the teacher as a coach or facilitator of learning.
- Provide full support to students and instructors.
- Make changes to the curriculum system.
- Develop long term relationships between students and teachers.
- Have structures and processes to monitor implementation and effectiveness of development strategies of the institution.
- Use appropriate technology in the management and teaching.
- Provide interactive feedback from the control to process improvement.
- Have an annual review or evaluation of progress through indicators, which serve to meet future development needs of the institution.
- Use statistical process control in determining individual learning plans and assessments.

2.3.3 TQM in Higher Education

The main dimensions of higher education that should be assessed are producing graduates to meet the human resource needs of organizations and pushing forward the frontiers of knowledge through research (Green, 1994).

Currently there are accreditation schemes and institutions. These have what they call a model or the criteria. We can find it in ABET or SACS, however they do not offer a methodology, but only a set of requirements that a university has to conform or comply with. Nowadays, universities implement structures and procedures to comply with the requirements, but without any order, sequence, or structured effort. Accreditation is not a ranking system, but a peer-review process that assures the quality of post-secondary education (ABET, 2010). Accreditation is a review of the quality of higher education institutions and programs. In the U.S. accreditation is seen as the process through which students, families, government officials, and the press can make sure that an institution or program provides a quality education (CHEA, 2010).

There are also other models such as ISO 9000, or Malcolm Baldrige National Quality Program. Again these provide a set of requirements, to obtain a certification in the first case, and to compete for an award in the second case. However, none of them has an implementation methodology; which organizations are to figure out if they can certainly decide to implement it.

As to standards, it can be found IWA 2:2007 Quality Management Systems – Guidelines for the application of ISO 9001:2000 in education can be considered, taking

into account that it is not a methodology but only a guideline to help interpret the ISO 9001 model in the field of education.

2.3.3.1 Accreditation Board for Engineering and Technology. (ABET Criteria)

ABET is a federation of professional societies in engineering, technology and science that has established minimum criteria for the accreditation of educational programs in engineering, technology, applied science and computer science. ABET accreditation is a basic requirement for a degree program in engineering that leads to the licensure as a professional engineer in the United States (Davis, 2010).

The Engineers' Council for Professional Development (ECPD) was established in 1932. ECPD was formed to fill in the need for a “joint program for upbuilding engineering as a profession”, a need determined through surveys conducted by professional engineering societies back in the 1920s.

Seven engineering societies founded the organization and contributed to its aims and focus: The American Society of Civil Engineers (ASCE), the American Institute of Mining and Metallurgical Engineers (now the American Institute of Mining, Metallurgical, and Petroleum Engineers), the American Society of Mechanical Engineers (ASME), the American Institute of Electrical Engineers (now IEEE), the Society for the Promotion of Engineering Education (now the American Society for Engineering Education), the American Institute of Chemical Engineers (AIChE), and the National Council of State Boards of Engineering Examiners (now NCEES). In 1980 ECPD was renamed as the Accreditation Board for Engineering and Technology (ABET) to describe its emphasis on accreditation more accurately (ABET, 2009).

ABET accreditation ensures that a college or university program meets the quality standards established by the profession for which it prepares its students. ABET does not accredit departments, colleges, or institutions, but accredits programs.

The quality standards that programs must meet to be ABET-accredited are set by the ABET professional societies themselves. This is made possible by the collaborative efforts of many different professional and technical societies. These societies and their members work together through ABET to develop the standards, and they provide the professionals who evaluate the programs to make sure they meet those standards.

The program that wants to be accredited for ABET should go through the following steps:

- a) The first step is that an institution requests an evaluation of its program or programs. Each program then conducts an internal evaluation (self-assessment) and completes a self-study questionnaire. The self study report is expected to be a qualitative and quantitative assessment of the strengths and limitations of the program being submitted for review. Only programs that have produced at least one graduate are eligible for accreditation.
- b) While the program conducts its self-assessment, the appropriate ABET commission (Applied Science, Computing, Engineering, or Technology Commission) forms an evaluation team to visit the university campus. A team chair and one or more program evaluators make up the evaluation team. Team members are volunteers from academic institutions, government, and industry, as well as private practice.

- c) During the on-campus visit, the evaluation team reviews course materials, student projects, and sample assignments as well as interviews students, faculty, and administrators. The team investigates whether the criteria are met and tackles any questions raised by the self-study.
- d) Following its campus visit, the team provides the school with a written report of the evaluation. This allows the program to correct any misrepresentations or errors of fact, as well as address any shortcomings in a timely manner.
- e) At a large annual meeting of all ABET commission members, the final evaluation report is presented by the evaluation team, along with its recommended accreditation action. Based on the findings of the report, the commission members vote on the action and the school is notified of the decision. The information the school receives identifies strengths, concerns, weaknesses, deficiencies, and recommendations for improvements. Accreditation is granted for a maximum of six years. To renew accreditation, the institution must request another evaluation.

The general criteria for Accrediting Engineering Programs is intended to assure quality and to foster the systematic pursuit of improvement in the quality of engineering education that satisfies the needs of stakeholders in a dynamic and competitive environment. The criteria are as follows:

Criterion 1: Students

The program must evaluate student performance, advise students regarding curricular and career matters, and monitor student's progress. The program must have

and enforce policies for the acceptance of transfer students and for the validation of courses taken for credit elsewhere and assure that all students meet all program requirements.

Criterion 2: Program Educational Objectives

Each program must meet:

- a) Have educational objectives consistent with the institution's mission.
- b) Periodically demonstrate that the objectives are based on the needs of the constituencies.
- c) Periodically demonstrate the extent to which these objectives are met.

Criterion 3: Program Outcomes

Engineering programs must demonstrate that their students achieve the following:

- a) Ability to apply knowledge of mathematics, science, and engineering
- b) Ability to design and conduct experiments, and to analyze and interpret data
- c) Ability to design a system, component, or process to meet desired needs within realistic constraints.
- d) Ability to work on multidisciplinary teams
- e) Ability to identify, formulate, and solve engineering problems
- f) Understanding of professional and ethical responsibility
- g) Ability to communicate effectively
- h) Broad education necessary to understand the impact of engineering solutions in a global and societal context
- i) Recognition of the need for, and an ability to engage in life-long learning

- j) Knowledge of contemporary issues
- k) Ability to use the techniques, skills, and modern engineering tools necessary for the practice of engineering.

Criterion 4: Continuous Improvement

Each program must show evidence of actions to improve the engineering program.

Criterion 5: Curriculum

The curriculum requirements specify subject areas appropriate to engineering but do not prescribe specific courses. The faculty must ensure that the program curriculum devotes adequate attention and time to each component, consistent with the outcomes and objectives of the program and institution. It must include:

- a) one year of a combination of college level mathematics and basic sciences (some with experimental experience) appropriate to the discipline
- b) one and one-half years of engineering topics, consisting of engineering sciences and engineering design appropriate to the student's field of study.
- c) a general education component that complements the technical content of the curriculum and is consistent with the program and institution objectives.

Criterion 6: Faculty

The faculty must be of sufficient number and must have the competencies needed to cover all of the curricular areas of the program.

The program faculty must have appropriate qualifications and must have and demonstrate sufficient authority to ensure the proper guidance of the program and to

develop and implement processes for the evaluation, assessment, and continuing improvement of the program, its educational objectives and outcomes.

Criterion 7: Facilities

The classrooms, laboratories, and associated equipment must be adequate to safely accomplish the program objectives and provide a good learning environment. Appropriate facilities must be available to foster faculty-student interaction and to create a climate that encourages professional development and professional activities.

Criterion 8: Support

Institutional support, financial resources, and constructive leadership must be adequate to assure the quality and continuity of the program.

Criterion 9: Program Criteria

Each program must satisfy applicable Program Criteria (if any). Program Criteria provide the specificity needed for interpretation of the baccalaureate level criteria as applicable to a given discipline.

The ABET criteria cannot be used as methodology or a model. However, its ability to serve as a means of quality assurance to engineering education has been proven over time, not only in the U.S. but in many other countries around the world. They assure minimal academic performance of a program and provide a basis for continuous improvement (ABET, 2009). They do not serve as a TQM model.

2.3.3.2 Southern Association of Colleges and Schools (SACS) Criteria

The Southern Association of Colleges and Schools Commission on Colleges (from now on SACS until the end of this document) is the regional body for the accreditation of degree-granting higher education institutions in the Southern states of the US. It is a private, nonprofit, voluntary organization founded in 1895 in Atlanta, Georgia (SACS, 2009).

Accreditation by SACS means that the institution complies with the following:

- Has a mission appropriate to higher education,
- Has sufficient resources, programs, and services sufficient to accomplish and sustain that mission,
- Maintains clearly specified educational objectives that are consistent with its mission and appropriate to the degrees it offers, and that indicate whether it is successful in achieving its stated objectives.

SACS bases its accreditation of degree-granting higher education institutions and entities on requirements in the following areas Principle of Integrity, Core Requirements, Comprehensive Standards, additional Federal Requirements, and policies of SACS.

Principle of Integrity:

Integrity is essential to the purpose of higher education, since it functions as the basic agreement defining the relationship between SACS and each of its member and candidate institutions. Therefore, evidence of withholding information, providing inaccurate information to the public, failing to give timely and accurate information to SACS, or failing to conduct an honest self-assessment of compliance with the Principles

of accreditation and to present this assessment to SACS, and other similar practices will be seen as the lack of a full commitment to integrity. The institution should operate with integrity in all matters.

Core Requirements

These are basic, holistic, foundational requirements that an institution must meet to be accredited by SACS. They establish a threshold of development required from an institution seeking initial or continued accreditation by SACS and reflect its expectations of candidate and member institutions:

- Degree-granting Authority: The institution has degree-granting authority from the appropriate entities.
- Governing Board: The institution has a governing board of at least five members which is the legal body with specific authority over the institution.
- Chief Executive Officer: The institution has a chief executive officer whose primary responsibility is to the institution (university) and who is not the presiding officer of the board.
- Institutional Mission: The institution has a clearly defined, comprehensive, and published mission statement that is specific to the institution and appropriate for higher education.
- Institutional Effectiveness: The institution engages in ongoing, integrated, and institution-wide research-based planning and evaluation processes.
- Continuous Operation: The institution is currently operating and has students enrolled in degree programs.

- About the programs:
 - a) Program Length: The institution offers one or more degree programs based on at least 60 semester credit hours or the equivalent at the associate level; at least 120 semester credit hours or the equivalent at the baccalaureate level; or at least 30 semester credit hours or the equivalent at the post-baccalaureate, graduate, or professional level. If an institution uses a unit other than semester credit hours, it provides an explanation for the equivalency.
 - b) Program Content: The institution offers degree programs that include a coherent course of study that is compatible with its stated mission and is based upon fields of study appropriate to higher education.
 - c) General Education: In each undergraduate degree program, the institution requires the successful completion of a general education component at the collegiate level that is a substantial component of each undergraduate degree, ensures breadth of knowledge, and is based on a coherent rationale. For degree completion in associate programs, the component constitutes a minimum of 15 semester hours or the equivalent; for baccalaureate programs, a minimum of 30 semester hours or the equivalent. These credit hours are to be drawn from and include at least one course from each of the following areas: humanities/fine arts, social/behavioral sciences, and natural science/ mathematics.
 - d) Course work for Degrees: The institution provides instruction for all course work required for at least one degree program at each level at which it awards degrees.

- Faculty: The number of full-time faculty members is adequate to support the mission of the institution and to ensure the quality and integrity of its academic programs.
- Learning Resources and Services: The institution, through owns or has formal agreements to provide and support student and faculty access as well as user privileges to adequate library collections and services and to other learning/information resources consistent with the degrees offered.
- Student Support Services: The institution provides student support programs, services, and activities consistent with its mission that promote student learning and enhance the development of its students.
- About Financial y Physical Resources:
 - a) Financial Resources: The institution has a sound financial base and demonstrated financial stability to support the mission of the institution and the scope of its programs and services.
 - b) Physical Resources: The institution has adequate physical resources to support the mission of the institution and the scope of its programs and services.
- Quality Enhancement Plan: The institution has developed an acceptable Quality Enhancement Plan (QEP) that includes an institutional process for identifying key issues emerging from institutional assessment and focuses on learning outcomes and/or the environment supporting student learning and accomplishing the mission of the institution.

Comprehensive Standards

The Comprehensive Standards establish requirements in the following four areas:

- Institutional mission, governance, and effectiveness;

- Programs;
- Resources;
- Institutional responsibility for SACS policies.

These standards are more specific to the operations of the institution, represent good practice in higher education, and set a level of accomplishment expected of all member institutions.

Implicit in every Comprehensive Standard mandating a policy or procedure is the expectation that the policy or procedure is in writing and has been approved through appropriate institutional processes, as well as published in appropriate institutional documents accessible to those affected by the policy or procedure, and implemented and enforced by the institution.

Federal Requirements

Implicit in every Federal Requirement mandating a policy or procedure is the expectation that the policy or procedure is in writing and has been approved through appropriate institutional processes, published in appropriate institutional documents accessible to those affected by the policy or procedure, and implemented and enforced by the institution.

- a) Student achievement: The institution evaluates success regarding student achievement including, as appropriate, consideration of course completion, state licensing examinations, and job placement rates.

- b) Program curriculum: The institution's curriculum is directly related and appropriate to the purpose and goals of the institution and the diplomas, certificates, or degrees awarded.
- c) Publication of policies: The institution makes available to students and the public current academic calendars, grading policies, and refund policies.
- d) Program length: Program length is appropriate for each of the institution's educational programs.
- e) Student complaints: The institution has adequate procedures for addressing written student complaints and is responsible for demonstrating that it follows those procedures when resolving student complaints.
- f) Recruitment materials: Recruitment materials and presentations accurately represent the institution's practices and policies.
- g) Program responsibilities: The institution is in compliance with its program responsibilities under Title IV of the *1998 Higher Education Amendments*.

This is a summary of the requirements that a higher education institution has to comply with in order to obtain accreditation. Besides, there is the need to set up an organization and to develop a plan in order to implement a system that would allow the higher education institution to reach the standards and sustain it over time. Moreover the accreditation process is a complex, multifaceted and transactional process that requires buy-in from all stakeholders, both internal and external. As a quality initiative, it needs collaboration across all the areas of the institution (Katsinas, 2009).

Both ABET and SACS are recognized by the Council for Higher Education Accreditation (CHEA), in other words CHEA accredits the accreditors in the US, overseeing the accreditation processes.

2.3.3.3 ISO 9000 Quality Management Systems Model

The ISO 9000 standards are a set of international management standards and guidelines. First published in 1987, there was a second version in 1994; however a major update was made in 2000 when the emphasis changed from documenting processes and record keeping to one of customer satisfaction, business improvement and excellence. This was a major learning experience for many people in business and also for many quality auditors and consultants.

In November 2008, the standards were updated again but the changes were mainly made to clarify a few points and also to make it easier to translate the standards into languages other than English and French without the meaning becoming obscured.

The ISO 9001:2008 standard provides a quality management system model for determining and meeting customer requirements and enhancing its satisfaction (Figure 2). It is generic and applicable to all kinds of organizations. Therefore, organizations from both the public and private sectors, including non-governmental organizations can benefit from the ISO 9001 quality management system model, regardless of whether they are small, medium or large organizations. The immediate benefit that can be realized from the implementation of ISO 9001 is the collective alignment of the activities of internal processes that are focused towards the enhancement of customer satisfaction which will

result in many other benefits, whether internal or external. The magnitude of these benefits is determined by how effective the processes are in achieving its objectives.

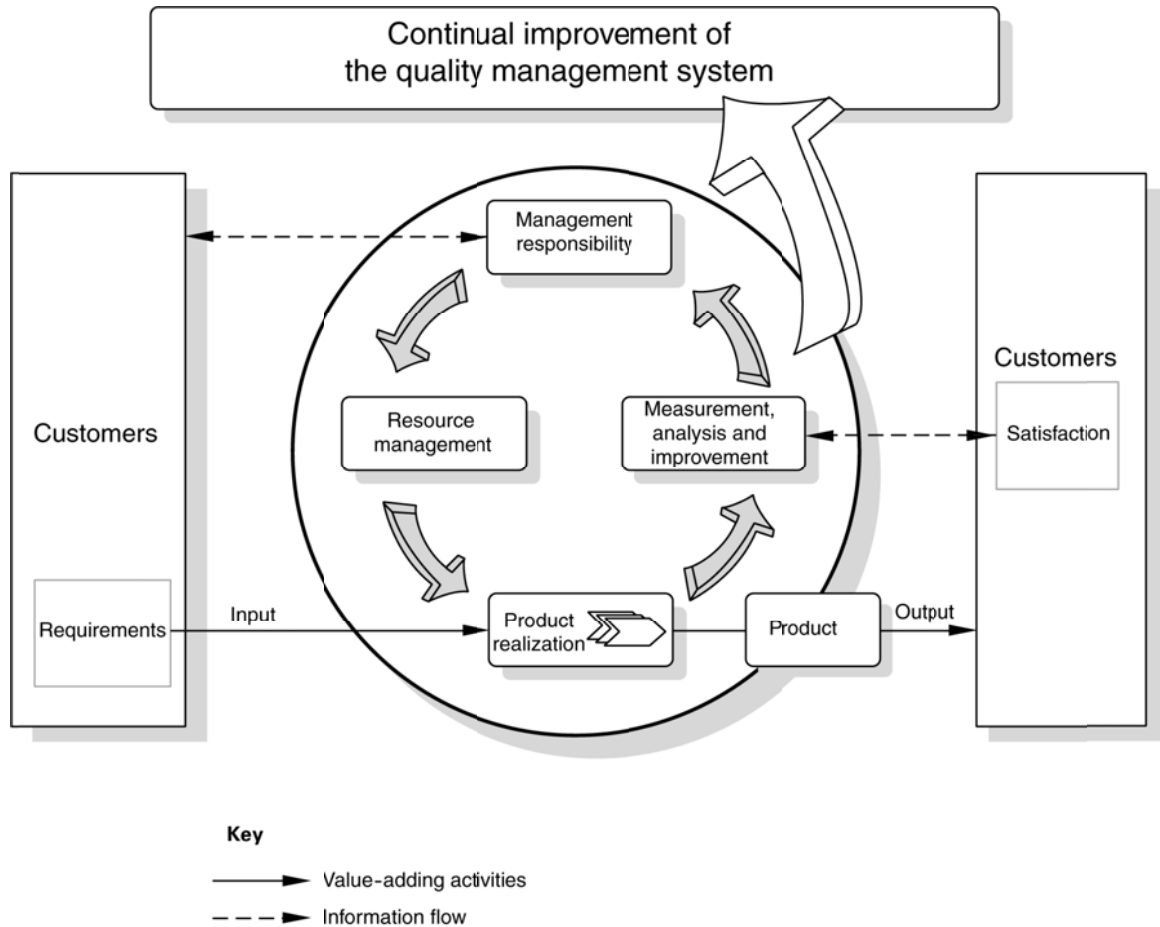


Figure 2: ISO 9001:2008 model (ISO, 2008)

All requirements of ISO 9001:2008 are generic and are intended to be applicable to all organizations, regardless of the type, size and product provided. Organizations can ask for exclusion of clause 7, which is accepted if such exclusion does not affect the

organization's ability, or responsibility, to provide a product that meets customer's and requirements and those applicable statutory and regulatory requirements.

Following is a summary of the requirements of the model:

Clause 4: Quality management system

The clause 4 of ISO 9001:2008 covers documentation requirement and requirements for control of documents and records.

- General requirements: ISO 9001:2008 clause 4.1 General requirements requires an organization to “establish, document, implement, and maintain a quality management system and continually improve its effectiveness in accordance with the requirements of this International Standard”
- Documentation Requirements
 - a) General: explains that the quality management system documentation shall include:
 - documented statements of a quality policy and quality objectives;
 - a quality manual
 - documented procedures required by this International Standard
 - documents needed *by the organization* to ensure the effective planning, operation and control of its processes, and
 - records required by this International Standard;

ISO 9001:2008 specifically requires the organization to have “documented procedures” for the following six activities: 4.2.3 Control of documents, 4.2.4 Control of

records, 8.2.2 Internal audit, 8.3 Control of nonconforming product, 8.5.2 Corrective action, 8.5.3 Preventive action.

b) Quality manual: To establish a quality manual for your organization and maintain your organization's quality manual.

It specifies the minimum content for a quality manual. The format and structure of the manual is a decision for each organization, and will depend on the organization's size, culture and complexity. The quality manual is a document that has to be controlled in accordance with the requirements of clause 4.2.3.

c) Control of documents: To control the organization's QMS documents and the ones that are used as QMS records.

d) Control of records: To establish the organization's QMS records and a procedure to control the QMS records.

Clause 5: Management responsibility

This clause requires:

- Showing management commitment to Quality
- Focusing on the customers,
- Supporting a quality policy
- Establishing quality objectives,
- Allocating QMS responsibility and authority, and
- Performing QMS management reviews

Clause 6: Resource management

The Resource Management section of the standard is designed to ensure that you review and provide the resources needed to implement and improve the system. Resources are looked at in three ways: people, infrastructure and work environment. It is about:

- Providing required QMS resources
- Providing competent QMS personnel
- Providing necessary infrastructure
- Providing suitable work environment

Clause 7: Product realization

This clause starts with planning. Plan the journey from the point where the customer asks for something, right through to delivery (and beyond if necessary). Product realization then goes on to ensure you have sound systems in place to control:

- Controlling product realization planning
- Controlling customer-related processes
- Controlling product design and development
- Controlling purchasing and purchased products
- Controlling production and service provision
- Controlling monitoring and measuring equipment

Clause 8: Measurement, analysis and improvement

Process Performance involves recording and detailing the historical performance of the process, obtaining perceptual views of both current and historical performance from customers and suppliers, defining the agreed required performance of the future improved process, and agreeing how it will be measured, monitored and reviewed. Data must be gathered and analyzed – this can be accomplished via several means, including observation, counting, workshops, interviews, focus groups and questionnaires, to name a few.

The outcomes of Process Performance are an understanding of the key metric data, the underlying capability of the process and customers', suppliers' and staff requirements for the future improved process. It requires:

- Establishing monitoring and measurement processes
- Carrying out monitoring and measurement activities
- Identifying and control nonconforming products
- Collecting and analyze quality management data
- Making improvements and take remedial actions

The ISO 9001 model follows the P-D-C-A cycle as shown in Figure 3.

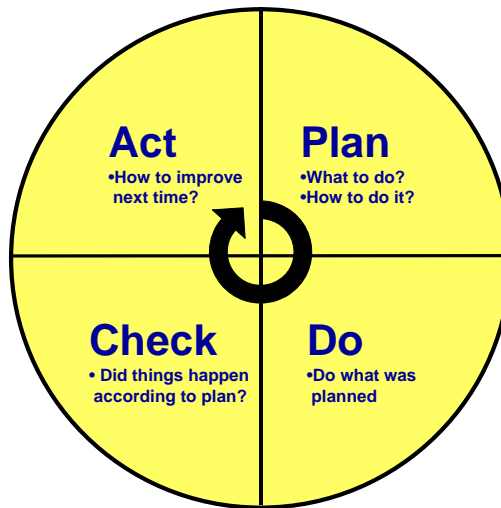


Figure 3: Plan-Do-Check-Act (PDCA)

2.3.3.4 Baldrige Criteria for Performance Excellence Model

The Baldrige Criteria is based on public law 100-107, which created a public private partnership designed to improve quality and maximize productivity growth by setting standards of excellence that enable American companies to combat global competition.

The intent of Baldrige Criteria is to improve value to customers and overall financial performance for shareholders, owners, and other stakeholders. This criteria is based on several questions to ask about performance, may be outstanding model to use to anchor improvement organizations. The Baldrige Criteria promotes three objectives:

- To assist an organization to improve performance practices, capabilities and results.
- To facilitate communication and the sharing of best practices information among U.S. organizations.

- To serve as a diagnostic tool for understanding and managing performance and for guiding organizational planning and opportunities for learning

The Baldrige Criteria includes an organizational profile comprising approximately 200 questions, in seven integrated categories. The following figure provides the framework connecting and integrating the Categories.

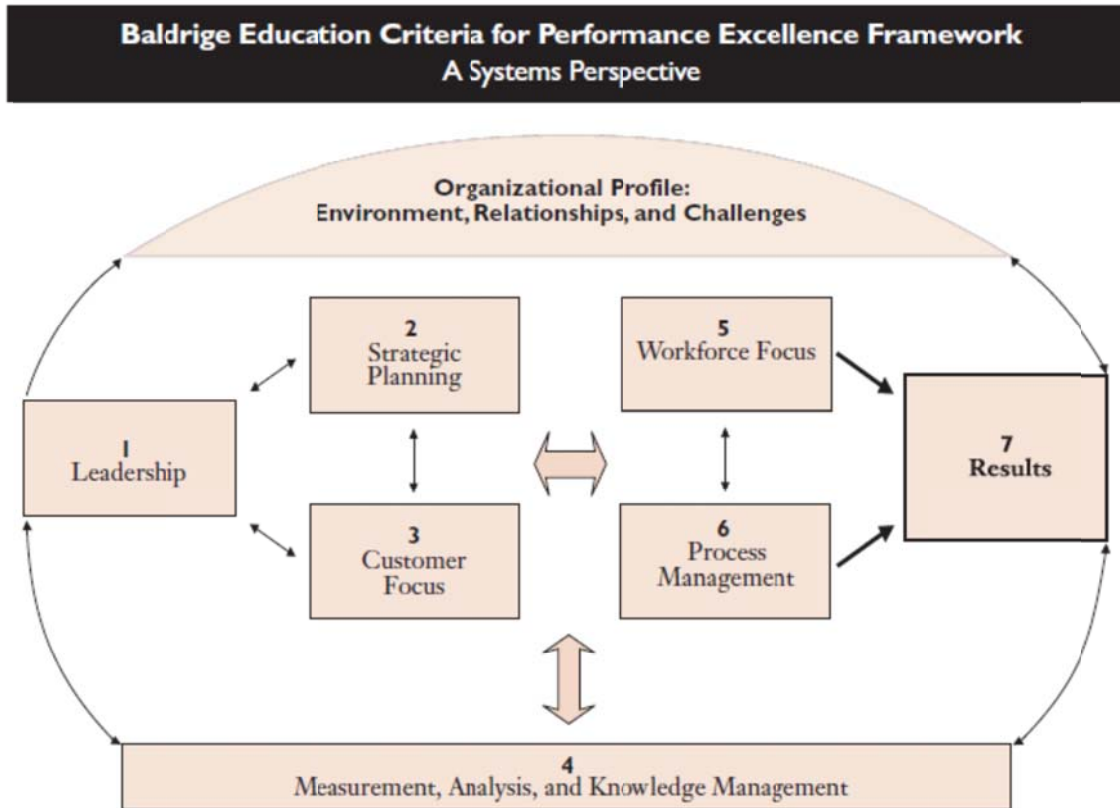


Figure 4: Baldrige model 2009-2010 (NIST, 2009)

This model has the following basic elements:

Organizational Profile

The Organizational Profile (top of Figure 4) sets the context for the way an organization operates. The environment, key working relationships, and strategic challenges and advantages serve as an overarching guide for the organizational performance management system.

System Operations

The system operations are composed of the six Baldrige Categories in the center of Figure 3 that define your operations and the results you achieve. Leadership (Category 1), Strategic Planning (Category 2), and Customer Focus (Category 3) represent the leadership triad. These Categories are placed together to emphasize the importance of a leadership focus on strategy and customers. Workforce Focus (Category 5), Process Management (Category 6), and Results (Category 7) represent the results triad.

- Category 1: Leadership: This category examines how the organization's senior leaders guide and sustain the organization. Also examined the organization's governance and how the organization addresses its ethical, legal and community responsibilities.
 - a) Item 1.1 Senior Leadership: Ask questions about vision and values, communication and organizational performance.
 - b) Item 1.2 Governance and Social Responsibility: Ask questions about organizational governance, legal and ethical behavior and support of key communities.

- Category 2: Strategic Planning: The strategic planning category examines how an organization develops strategic objectives and action plans. Also examined how strategic objectives are chosen and action plans are developed and changed if circumstances require, and how progress is measured.
 - a) Item 2.1 Strategy Development: Ask about strategy development process and strategy objectives.
 - b) Item 2.2 Strategy Deployment: Ask about action plan development and deployment, and performance projection.

- Category 3: Customer Focus: This category examines how an organization determines the requirements, needs, expectations, and preference of customers and markets. Also, examined how organizations build relationships with customers and determine the key factors that lead to customer acquisition, satisfaction, loyalty, and retention, and to business expansion and sustainability.
 - a) Item 3.1 Customer and market Knowledge: Ask about requirements, needs and expectation determination, and preferences of customers and markets.
 - b) Item 3.2 Customer Relationships and Satisfaction: Ask about customer relationship building and customer satisfactions determination.

- Category 5: Workforce Focus: The workforce focus category examines how an organization engages, manages, and develops the workforce to utilize its full potential in alignment with the organization's overall mission, strategy, and action plans. The

Category examines the ability to assess workforce capability and capacity needs and to build a workforce environment conducive to high performance.

- a) Item 5.1 Workforce Engagement: Ask about engage within an organization and its workforce to achieve organizational and personal success
- b) Item 5.2 Workforce Environment: Ask about how an organization builds an effective and supportive workforce environment.

- Category 6: Process Management: The process management category examines how an organization designs its work systems and how it designs, manages, and improves its key processes for implementing those work systems to deliver customer value and achieve organizational success and sustainability. The organization's workforce and key processes accomplish the work of the organization that yields your overall performance results.

- a) Item 6.1 Work Systems: Ask about how an organization designs its work systems, core competencies and emergency readiness.
- b) Item 6.2 Work Processes: Ask about how an organization designs, manages, and improves its key organizational work processes.

- Category 7: Results: The results category examines an organization's performance and improvement in all key areas— product outcomes, customer-focused outcomes, financial and market outcomes, workforce-focused outcomes, process effectiveness outcomes, and leadership outcomes. Performance levels are examined relative to those of competitors and other organizations with similar product offerings. All actions point

toward Results. The horizontal arrow in the center of the framework in the Figure 4 links the leadership triad to the results triad, a linkage critical to organizational success. Furthermore, the arrow indicates the central relationship between Leadership (Category 1) and Results (Category 7). The two-headed arrows indicate the importance of feedback in an effective performance management system.

- a) Item 7.1 Product Outcomes: Ask about what the product performance results are.
- b) Item 7.2 Customer-Focused Outcomes: Is aligned with the revised Category 3, asking for results related to customer engagement.
- c) Item 7.3 Financial and Market Outcomes: Ask about what the financial and marketplace performance results are.
- d) Item 7.4 Workforce-Focused Outcomes: Ask about what the workforce-focused performance results are.
- e) Item 7.5 Process Effectiveness Outcomes: Ask about what the process effectiveness results are.
- f) Item 7.6 Leadership Outcomes: Leadership Outcomes, now includes a question about the results for fulfillment of the societal responsibilities.

System Foundation

Measurement, Analysis, and Knowledge Management (Category 4) are critical to the effective management of an organization and to a fact-based, knowledge-driven system for improving performance and competitiveness. Measurement, analysis, and knowledge management serve as a foundation for the performance management system.

- Category 4: Measurement, Analysis, and Knowledge Management: The measurement, analysis, and knowledge management category examines how an organization selects, gathers, analyzes, manages, and improves its data, information, and knowledge assets and how it manages its information technology. The category also examines how an organization reviews and uses reviews to improve its performance.

- a) Item 4.1 Measurement, Analysis, and Improvement of Organizational Performance: Includes a separate Area to Address on Performance Improvement.

- b) Item 4.2 Management of Information, Information Technology and Knowledge: Clarifies which Criteria requirements are related to information technology by including the term in the title of the second Area to Address, Management of Information Resources and Technology.

Six Sigma and Lean Six Sigma do have a methodology called DMAIC and is one of the major strengths of these Quality programs, since a methodology provides a roadmap for quality improvement. However, it has not been designed to work in improving an organization, but project improvement. Moreover, not any project qualifies for DMAIC; it has to have particular characteristics.

ISO 9000, Six Sigma and Baldrige are three models, as well as ABET and SACS are two sets of criteria, all of them with the objective to support quality assurance and quality improvement of the educational institution. These five references focus on what should be done, and not how quality improvement could be achieved.

2.4 The need for quality improvement in universities

Universities are complex organizations which operate in a diverse and constantly changing environment, with shifting values, varying states of economic prosperity, and obscure permutations of political power (Bess and Dee, 2008). Universities are amongst the oldest institutions, founded in the Middle Ages (Haskins, 1923), and although there could be significant variability from one university to the other, an organization that chooses to define itself as a university, indicates the willingness to be recognized as such and have certain characteristics that distinguish this type of institution (Salmi, 2009).

The role of the University is crucial in the knowledge economy (Florida, 1999). This role is strongly linked with the development of a country's economy and society. Higher Education helps countries build globally competitive economies by developing a skilled, productive and flexible labor force and by creating, applying and spreading new ideas and technologies (Salmi, 2009).

Quality is not new in the educational context (Green, 1994). However, in the past, quality was internal to universities, yet there is a growing concern for accountability and the need for quality and efficiency. Quality is crucial to remain competitive and for the sustainability of a higher education system (Bologna Declaration, 1999). The quality of higher education institutions is measured, considering different criteria to assess several facets of universities and its ability to produce graduates, research output and technology transfer. These can be attributed to three complementary sets of factors that can be found in top universities: a) a high concentration of talent, b) abundant resources, and c) favorable governance (Salmi, 2009), as shown in Figure 5.

The concentration of talents is one of the most determinant factors of excellence, that is, the presence of a critical mass of top students and outstanding faculty members, therefore one of the main characteristics of the best quality, World-class universities is the ability to attract the best students, as well as to attract and retain the best professors and researchers. Abundance of resources is another element, and it is a response to the huge costs involved in managing a complex university, with several full-time professors and the infrastructure with all the resources for high quality teaching-learning processes as well as research. Appropriate governance is the third element which relates with the overall organizational framework, the competitive environment and the degree of managerial autonomy that a university has. The environment in which a university operates, promotes competitiveness, critical thinking and innovation. Good governance fosters educational quality (The Task Force on Higher Education and Society, 2000).

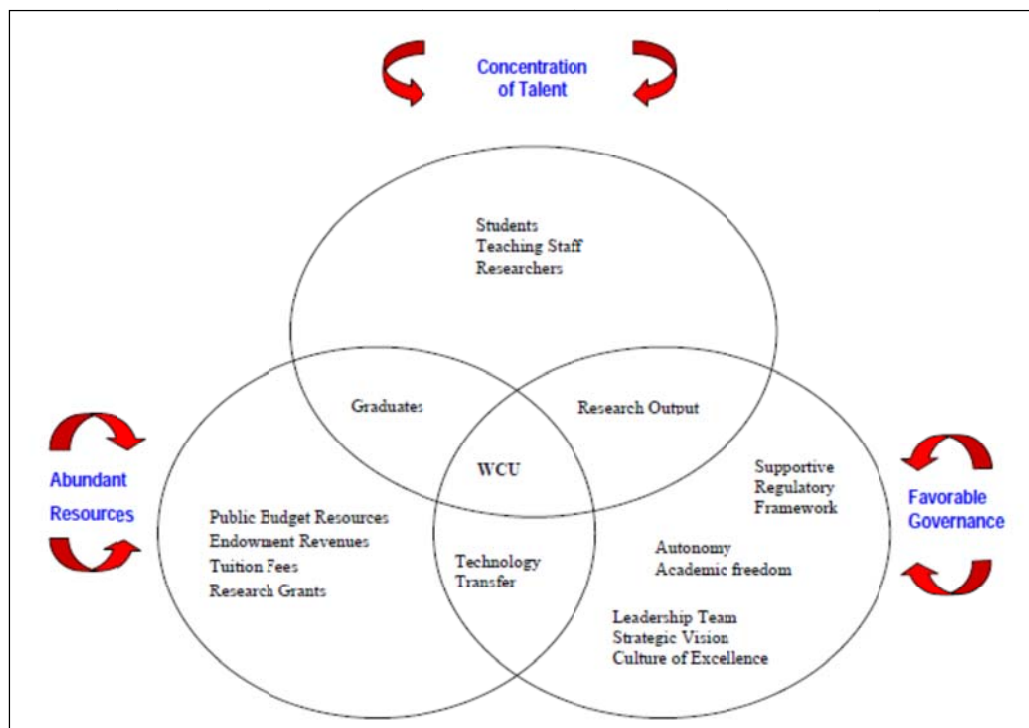


Figure 5: Characteristics of a World-class University (Salmi, 2009)

However defining what is a World-class university, is in itself a task that has not reached consensus yet. Furthermore, it is mentioned that many of those who decide to define “world classness” do not know what they are talking about (Altbach, 2004). Not even quality measurement of universities in terms of international rankings is standardized, and after decades of assessment research the higher education community has only some better sense of what university quality is (Brooks, 2005).

The top ten World Class universities are found mainly in the US, the UK, and depending on the ranking, France, China, Japan, and Australia have one university amongst the top 20, and Canada, Singapore, and Switzerland amongst the Top 40 (Levin, 2006). Thus, the universities belong to either developed countries or countries with emerging economies. However it seems difficult to understand how emerging countries such as India has only two universities in the top 200 and Brazil no universities in this group (Times Higher Education, THES 2009).

However, a question to address would be how a country could transition from developing to emerging, and then to developed without having high quality universities? In other words, how to improve the development levels of a country without good quality universities?

Table 1: Top 20 Universities in World Rankings 2006 (Salmi, 2009)

| Rank | THES | Rank | SJTU |
|------|--------------------------------------------------|------|------------------------------------------|
| 1 | Harvard University | 1 | Harvard University |
| 2 | University of Cambridge | 2 | University of Cambridge |
| 3 | University of Oxford | 3 | Stanford University |
| 4 | Massachusetts Institute of Technology | 4 | University of California - Berkeley |
| 4 | Yale University | 5 | Massachusetts Institute of Technology |
| 6 | Stanford University | 6 | California Institute of Technology |
| 7 | California Institute of Technology | 7 | Columbia University |
| 8 | University of California, Berkeley | 8 | Princeton University |
| 9 | Imperial College London | 9 | University of Chicago |
| 10 | Princeton University | 10 | University of Oxford |
| 11 | University of Chicago | 11 | Yale University |
| 12 | Columbia University | 12 | Cornell University |
| 13 | Duke University | 13 | University of California - San Diego |
| 14 | Beijing University | 14 | University of California - Los Angeles |
| 15 | Cornell University | 15 | University of Pennsylvania |
| 16 | Australian National University | 16 | University of Wisconsin - Madison |
| 17 | London School of Economics and Political Science | 17 | University of Washington - Seattle |
| 18 | Ecole Normale Supérieure (Paris) | 18 | University of California – San Francisco |
| 19 | National University of Singapore | 19 | Johns Hopkins University |
| 19 | Tokyo University | 20 | Tokyo University |

Regarding world rankings and Latin American universities, Webometrics includes only two amongst the top 50 (Webometrics, 2009), one Brazilian and the other Mexican. There is the need also to improve the quality of these universities, as was mentioned during a conference on higher education organized by UNESCO with the participation of 700 Latin American universities (Yarzabal, 1999). A newfound legitimacy for the goals of raising quality and making education more relevant to economic goals through university industry relations has been slowly finding its way into academic culture that once opposed them (Bernasconi, 2007).

This institution called University is the main element in higher education and education. OECD (2009) and other institutions have demonstrated the strong link between a country's national investment in education and in particular higher (or tertiary) education and a country's level of development. Although universities are the organizations that focus research and publish new knowledge, there is not much research or publications that study the university as an organization.

In the search for quality in universities, World-class universities have been identified. However it is as important to have national or regional class academic institutions, as it is to follow the most elitist universities (Altbach, 2004). The irony of world-class universities is that “everybody wants one, no one knows what it is, and no one knows how to get one” (Altbach, 2004). The lack of a methodology to improve quality in a structured and holistic way raises the issue of the need to have a Total Quality Management approach to sustainable quality improvement. Without managing for quality, quality results are left to chance and are not the result of planning; there is no understanding of cause and effect. Managing for quality is the process of identifying and administering the activities needed to achieve the quality objectives of the organization (Juran 2007).

2.5 Summary

Two sets of criteria: ABET and SACS and three models: ISO 9000, Baldrige and Six Sigma have been presented. As depicted in Figure 6 the criteria in ABET and SACS have been used as a reference for the initial parts of a planning for quality process, whereas the elements of the three models have been used as a reference for the latter parts of the same process.

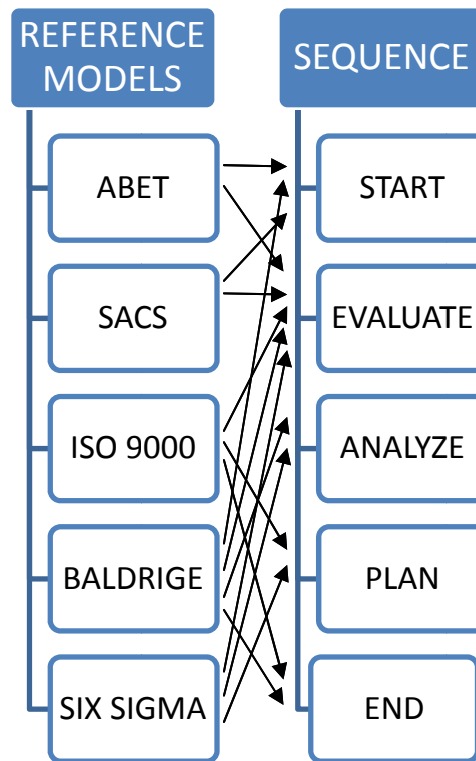


Figure 6: Two sets of criteria and three reference models

3 SOLUTION APPROACH AND RESEARCH PLAN

3.1 Solution approach

The proposed methodology builds on the study of successful TQM models and the best practices implemented in industry with an analysis of elements usable in a university environment, while considering that universities are unique organizations as compared to companies and that quality of education is also unique in the context of TQM. These elements are used as input to the methodology development. The 7-step meta-methodology reported in Thomann (1973) is adopted for development of the TQM methodology.

3.2 Research plan

Based on the meta-methodology, the research plan is decomposed into 7 major steps as depicted in Figure 7. In particular, the sixth step in the research plan will lead to development of the procedure of the TQM Methodology. The methodology consists of sequenced phases, of which each includes a purpose, key activities, deliverables and tools. Each activity in each phase follows a sequence of sub-activities equipped with input, output, control, and tool/resource information. These data are organized into an IDEF0 model using the IDEF modeling concept. The main deliverable is the TQM Methodology. However, there are also secondary deliverables in this design process. One of them is a comprehensive list of input elements for the design.

The proposed TQM methodology is applied to a case university to demonstrate how a TQM Plan is developed for the university by following its steps and activities. It is

a step by step construction process by following the proposed methodology. The TQM methodology and TQM Plan are evaluated by a group of subject experts in TQM and higher education. This type of validation is considered hard, as pointed out by Klugl (2008) which states: “One may argue why face validity is needed when statistical validation is successfully done? Face validation assures that the process and structures are reasonable for a human expert.”

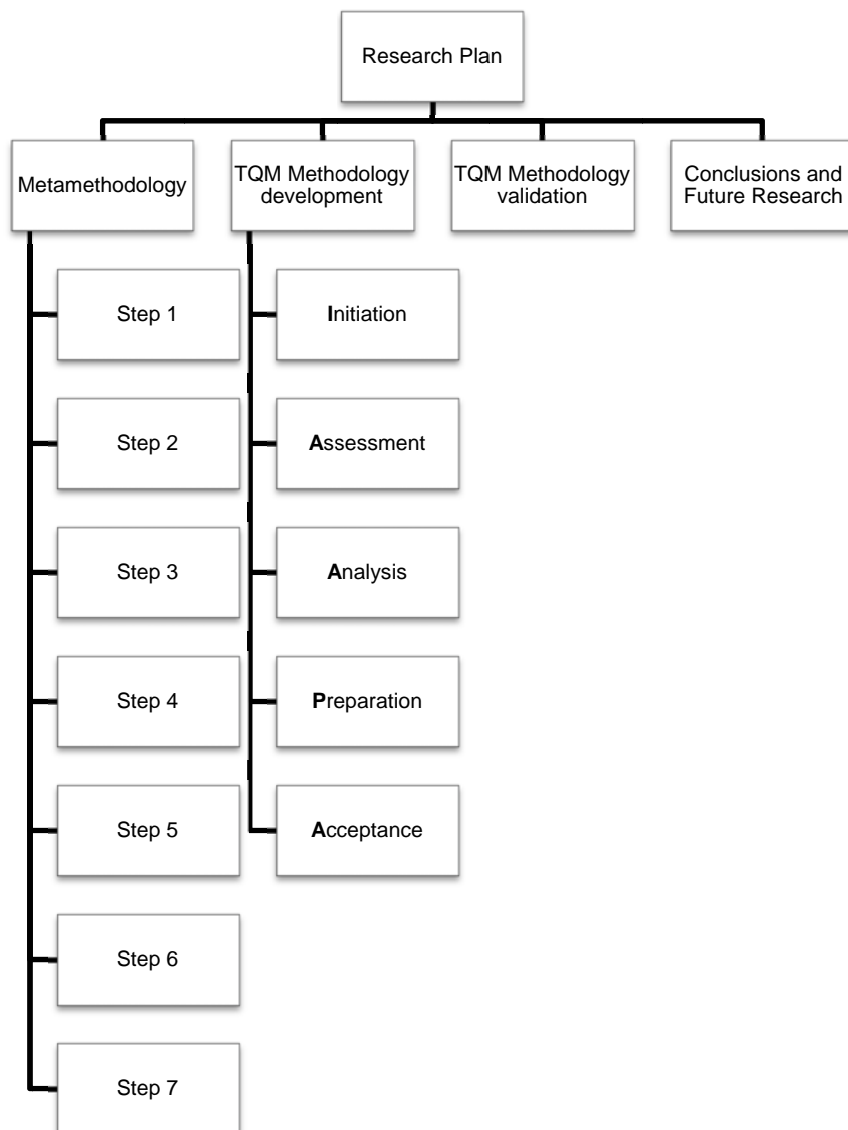


Figure 7: Work Breakdown Structure TQM Methodology development

3.3 The process model approach

In order to analyze and formulate the methodology the following model is presented as a support in the analysis and further design of the methodology which would view the process as a production or realization system.

ISO defines process as a set of activities mutually linked or inter-acting, transforming inputs into outputs (ISO, 2005). It is a basic definition involving, input, transformation and output. Montgomery, in addition to inputs, outputs and the transformation, includes other variables called controllable factors and uncontrollable factors, in his representation of a “general model of a process or a system” (Montgomery, 2009), as shown in Figure 8.

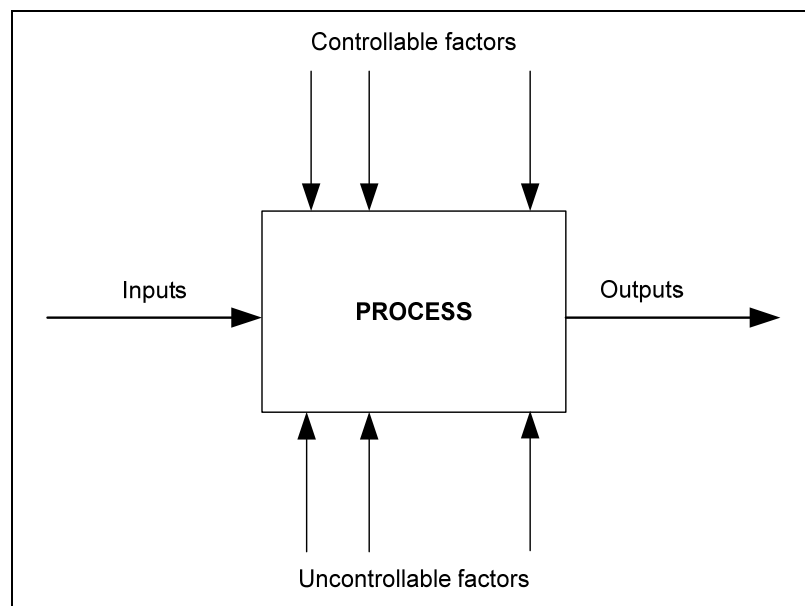


Figure 8: General model of a process or a system (Montgomery, 2009)

IDEF0 also identifies inputs and outputs to the process. In addition it mentions Controls and Mechanisms. Inputs are the typical things such as resources consumed or transformed by a process. Outputs are the typical things created by the transformation of the inputs by the process. Controls are the standards, policies, guidelines, etc. that guide the process. Mechanisms are the agents (people, manual tools, automated tools, etc.) that achieve the actions indicated within the process (NIST, 1993).

The arrows denote pipelines that either information or objects flow through. The role the arrows fulfill is described by the acronym ICOM: Inputs enter the left of the box, Controls enter the top of the box, Outputs leave the right of the box and Mechanisms enter the bottom of the box. An IDEF0 function model, as shown in Figure 9, is a collection of diagrams, organized in a hierarchy such that each diagram represents a decomposition of a higher-level diagram. This is called the parent diagram and the lower-level decompositions from that diagram are each child diagrams (Giachetti, 2010)

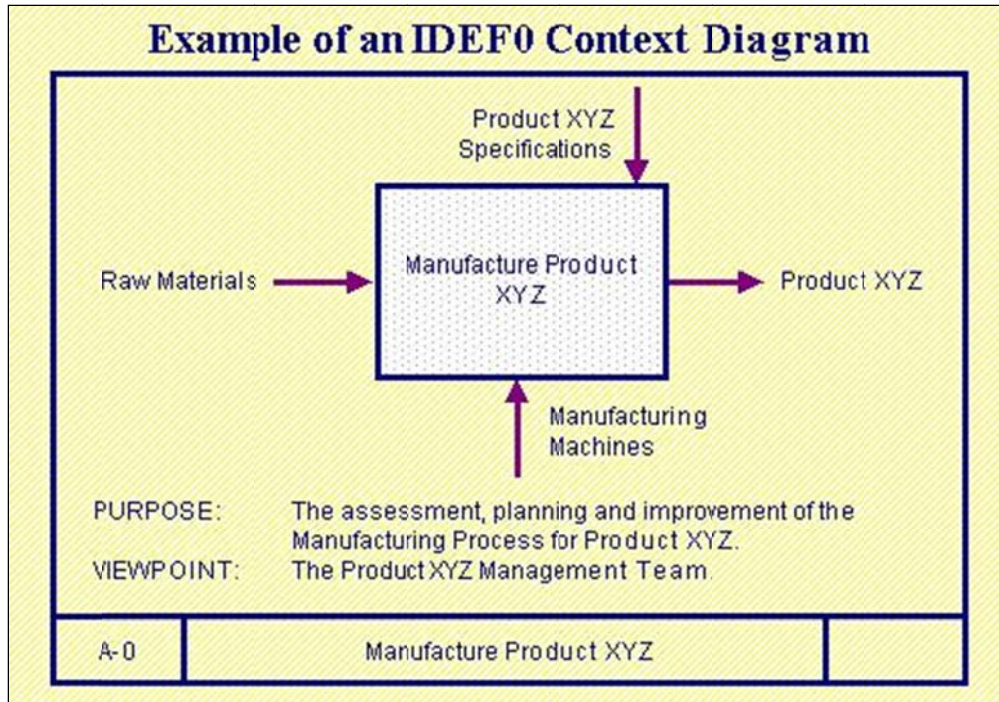


Figure 9: IDEF0 Box and Arrow Graphics (KBSI, 2009)

ISO defining the process approach included the model of its Generic Process in its model of quality management system. Figure 10 depicts the input, the process and the output, and two concepts: the effectiveness of the process and the efficiency of the process (ISO, 2004).

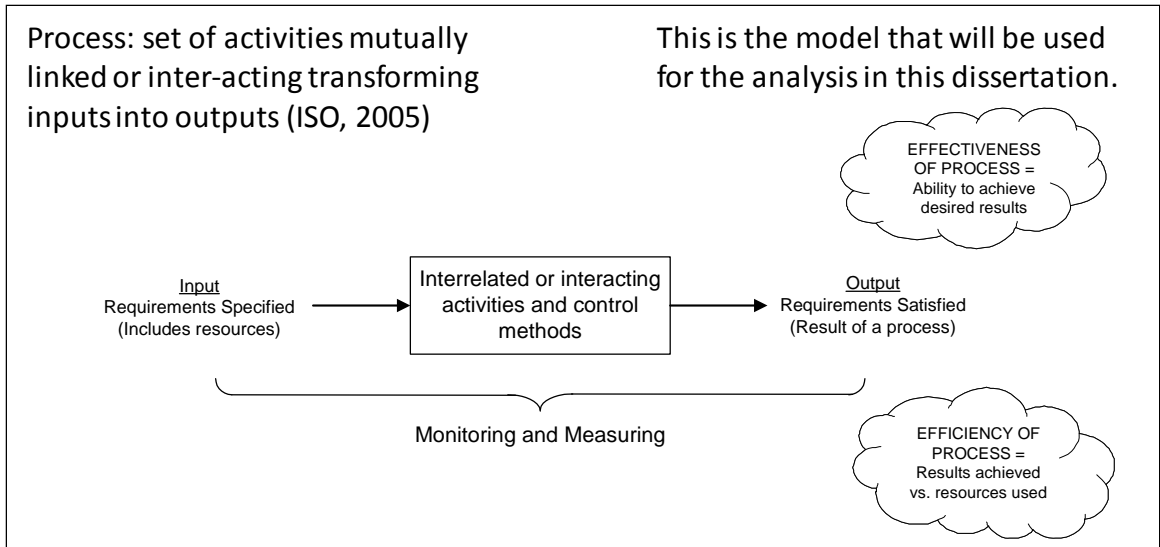


Figure 10: ISO 9000's process approach. Generic Process (ISO, 2004)

In the same document, a sequence of processes is described, showing how a network of the processes and their interactions is built. The outputs of one process could be the inputs to other processes, and interlinked to the overall network system, as shown in Figure 11.

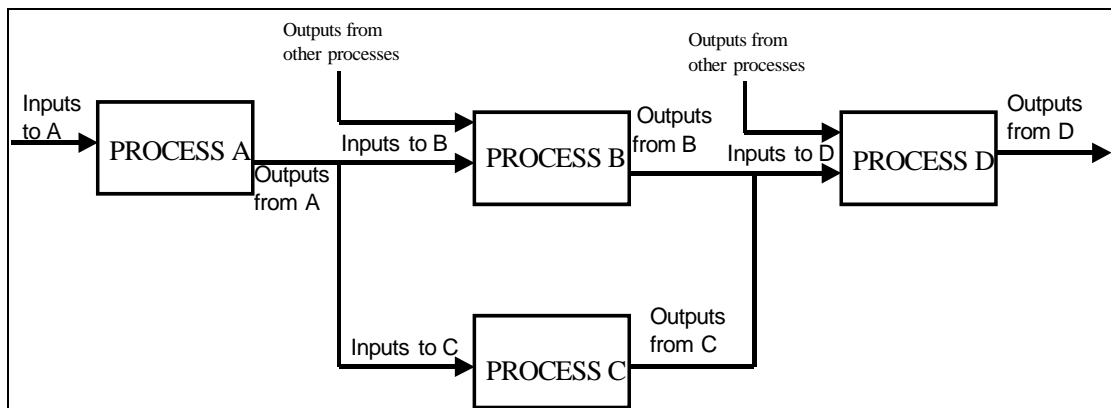


Figure 11: Example of a generic process sequence (ISO, 2004)

These models help us to understand how the transformations are made, and how quality is built into the product by the process. Regardless of the type of product or process, this interaction is universal and could be applied to any sector or process or product, since as long as there is a transformation.

Universities have three facets which translate into three main streams of work: producing graduates, generating research, and technology transfer (e.g. projects, consultancy, and continuing education). For each one of these facets, there should be streams of processes, and a methodology to be devised.

The models presented are all useful for the purpose of this study; however, the model that best adjusts is the IDEF0 which will be used in the following section.

4 TQM METHODOLOGY DEVELOPMENT

The TQM Methodology will be developed using the meta-methodology. The TQM Methodology to be developed will be a tool which will transform an input into output. This methodology is a guide that will be used as a roadmap for the development of the TQM Plan.

4.1 Input for design of methodology

Using as a reference section 7.3 of ISO 9001:2008 “Design and development”, it is necessary to have the input for the design of the methodology. In other words, for each process stream the main input elements are required, in terms of functionality requirements, performance requirements, and legal and regulatory requirements, information from other similar designs, any other requirement needed for the design and development. These inputs will also be analyzed.

4.1.1 Producing graduates and post-graduates

As in a product specification, information about what is expected in the final product, including quality characteristics and functionality should be documented

4.1.1.1 Undergraduate education

At the end of the process the final results would have customers, clients and stakeholders. Accreditation criteria, such as ABET recognize there are entities directly interested in a good quality professional ready to begin his or her professional career. For example, the process should be able to develop in the graduates the ability to function in

multidisciplinary teams, and the ability to apply knowledge of mathematics, science and engineering. Also, the process should develop the ability to design and conduct experiments, as well as to analyze and interpret the data. Ability to design a system, component or process to meet desired needs within realistic constraints such as economical, environmental, social, political, ethical, health and safety, manufacturability, and sustainability among others (ABET, 2009).

These characteristics serve as a basis to design the network of processes that would have to develop these abilities. However, it is not only a matter of abilities or knowledge and skills, which are very important, since employers would be evaluating and measuring in order to take a hiring decision, but also education is about developing citizenship in students, enabling a student to conduct himself or herself as a civilized person in the different environments in which they have and need to interact.

Moreover, the previous have been specifications that should be met, in terms of developing these abilities in the students. However, as discussed in chapter 2, another very important input or Mechanism, in terms of the IDEF0 model is the pedagogical factor. Faculty members should comply with a set of requirements that would enable them to participate in the quality process that would be designed. In addition, the other factors such as socio-cultural and the institutional have to be taken into account.

4.1.1.2 Post-graduate education

Both ABET and SACS include in their criteria aspects to be considered for Master and Doctoral programs. These indicate for example, that the programs must develop, publish, and periodically review, educational objectives and program outcomes. Also the programs should be able to demonstrate that graduates have an ability to apply master's

level knowledge in a specialized area related to the program area. The master's and doctoral degree programs should be progressively more advanced in academic content than its undergraduate programs. The institution must structure its graduate curricula to include knowledge of the literature of the discipline and to ensure ongoing student engagement in research and/or appropriate professional practice and training experience. It is also well known, that students should be able to develop research skills, as well as the ability of writing academic documents.

4.1.1.3 Graduate and Undergraduate education

SACS also states that it is necessary that the institution develops admission policies consistent with its mission. Also that the institution provides appropriate academic support services, as well as requires that the institution uses technology to enhance student learning, library, among others.

There are other requirements, related to student affairs, financial, resources, and physical resources among other that should be included in the input.

4.1.2 Generation of research

Again, the expectations are linked to the quality and quantity of research that the university plans to produce. This will be related to building an environment suitable for research, professors with academic abilities as well as fund-raising capabilities, students with the knowledge and capabilities to engage in research processes. The post-graduate programs would be the basis for attracting students to research, as well as providing the knowledge needed to develop areas of research where a Department, School, or College would decide to concentrate its efforts. The library and all the related resources are also

very important in providing the means to obtain state of the art as well as classic information as a very important input to the process.

Research is associated to publishing, since it is the subsequent process. The journal or periodical that accepts publishing an article would also serve as a basis to evaluate the level of quality of the product of the research projects and initiatives.

4.1.3 Teamwork

This is an essential input for the successful implementation of a TQM Plan. Teamwork at all levels is essential for a total quality initiative to achieve good results as it ensures involvement. However, this study covers only the planning stage; therefore, teamwork is desirable but not crucial towards success. It is advisable to build up relationships towards the implementation of the TQM Plan, which is beyond the scope of this study.

4.2 TQM Methodology development using meta-methodology

4.2.1 Put the methodologist in contact with the problem.

As explained earlier in this study, it has clearly been established the need for a TQM Methodology for universities. Universities do not lack quality nor do they neglect improvement. There are a big number of existing models, initiatives and schemes aimed at helping universities improve. Yet, Total Quality Management needs to be organized and for that to happen a well-structured Planning for Quality effort is required. There is no evidence of this methodology, and yes, there is a need to improve the quality of

universities as established in the literature review. Therefore, as described above, the higher education sector is interested in developing this methodology.

4.2.2 State the purpose of analyzing the area.

4.2.2.1 Investigate the problem area.

The literature review has included the need to improve the quality of the universities, and how there is a lack of a methodology to carry out a structured effort of planning for quality. We talked with university professors and experts in quality regarding the absence of a methodology and how important it would be to have a methodology that would be refined over time.

Above was discussed the work in the field finding models and approaches for improving the quality of the University such as those proposed by the agencies ABET and SACS. It has also been included, models that even though they have not been designed for use in universities, these have been adapted for their use, such as the case of ISO 9000 and Baldrige. However, as already mentioned, these models do not offer a methodology but criteria or requirements to meet or achieve.

Using brainstorming to investigate contributions to the overall quality improvement of universities emerges the objective of this study, which is to prepare a TQM plan in a structured way. This would solve the problem of the lack of methodology, and more importantly to have available to universities a roadmap to facilitate the development of an improvement plan that includes the whole university organization, in an improvement initiative project by project, once you have decided the priority areas of work called the quality dimensions (QD). Finally, the study's goal is to develop a

methodology based on the input of best practices in other sectors and adapt to the needs of the university, as well as designing new items for their joint implementation.

The existing tools presented, in particular models of accreditation and the three models that are mainly applied in business, do not contain a working methodology, with the exception of Six Sigma, which contain a methodology, but specifically for the development of improvement projects, but not for the development of a comprehensive quality program or Total Quality Management.

4.2.2.2 Narrow down area into manageable pieces.

Since the problem is the lack of a methodology to improve total quality and the need for quality in universities, this study focuses on the development of a methodology to develop a good TQM Plan. The problem is complex, because the need is for universities to improve and do so efficiently. It is therefore, in order to approximate a solution of the problem, start by preparing a good plan, then following the Deming cycle (PDCA), implement the plan, making adjustments to it, and put them into practice in an endless cycle of improvement, i.e. continuous improvement. Therefore, focusing on the problem is to develop a good plan, with the understanding that having a good planning is more likely to solve the problem. Later we must work on the implementation.

4.2.2.3 Investigate purposes within the chosen piece of the problem area.

Brainstorm ideas for solving the problem, the first purpose that emerged was the development of a methodology that allows direct intervention in universities, and achieve an improvement. Following this idea, among other purposes, it was discussed the purpose of developing a methodology for only one type of university, or universities of a

particular country or a particular region. Moreover, it was discussed the possibility of extending it to Colleges and Universities. Later, following the model of Salmi (2009) it was discussed about developing a methodology for addressing the three areas of the University: producing graduates, producing knowledge through research, and services and technology transfer. What was a useful purpose was to develop a methodology for developing a TQM Plan since this is tangible and can be subject to evaluation prior to implementation, and is a practical step which will further operationalize the preparation of the environment to engage the various bodies and entities within the university in order to make this a total and comprehensive effort.

Then it was analyzed the mission of the university, and which is more aligned with it is teaching in higher education offering graduate and postgraduate degrees as well as the research process, both inherent in the work of the university. This is not to dismiss or diminish the importance of the work of the university in terms of extension services and technology transfer, but rather to focus on the essence of work in college, being the third, a result of the presence of university in society and its other two main activities: teaching and research.

When reading the literature it can be confirmed that there is no evidence of a methodology for the preparation of this plan or the development of a comprehensive organizational quality program. In terms of quality, the three major models and most widely used are the Quality Management Systems in particular the ISO 9000 model, the Baldrige performance excellence model and the model of Six Sigma and Lean Six Sigma. The latter two have a unique implementation methodology called DMAIC but for project improvement. ISO 9000 and Baldrige are not prescriptive, i.e. do not indicate how to do

something, but what requirements must be fulfilled. Both do not include a methodology for a specific purpose. In the case of ISO 9000 a set of requirements and in the case of a set of Baldrige criteria in both approaches the organizations are left free to decide to use the models, and to use their own methods or intuition. What is important that is the achievement of what is prescribed in the models and that there is evidence of compliance and can be evaluated. For ISO 9000 it can be assessed for certification and in the case of Baldrige with the opportunity to apply to an award if the organization is in the United States. Thus, none of these models has a methodology and a roadmap for the successful implementation. The case of Six Sigma and Lean Six Sigma is different. They do have a methodology, but to solve problems project by project, not to a general effort to TQM. Consequently, the methodology used, once the problems have been identified and have created projects for improvement. As indicated before it focuses on the improvement project by project, which is fine, but fails to resolve the problem that has arisen in this study, which is to develop a comprehensive improvement of the quality of university organization as a whole. Project by project work is only part of what needs to be done and not everything.

In the case of accreditation schemes, we have the example of models or requirements of ABET and SAC. In both cases we speak of university accreditation. ABET for academic programs, including engineering and an emphasis on the undergraduate level, in the case of SACS for accrediting institutions. In both cases, they have been designed with the requirements for a true university context, albeit in the very logic of ISO 9000 and Baldrige, indicating the criteria and requirements must be met to achieve accreditation, and do not indicate how or suggest a path forward. This is also

done on purpose so that universities have sufficient freedom and flexibility to achieve compliance in the way they see fit and appropriate for your particular situation. It is in these cases where universities develop improvements in an intuitive, unordered, unorganized and less efficient or less productive manner. Meetings are developed with targets, and projects to improve, but there is no component of planning for quality and efficiency and the need for overall improvement (TQM) in the process of improvement.

After long discussions with fellow university professors, we have come to the conclusion that it would be a good idea to reduce the scope of the methodology to the preparation of the Plan, rather than performing a methodology for direct intervention. This can be left for future research.

4.2.2.4 If more than one purpose has resulted from the previous step, then choose the most appropriate one.

The selected purpose is to develop a TQM Methodology for universities, which will lead to the preparation of a TQM Plan.

4.2.2.5 Check chosen purpose against the following: purpose not trivial and if purpose really solves the problem.

When defining the problem for this study, it was clearly pointed out the need for the purpose stated as well as the gap that needs to be filled out. The purpose established, will directly solve the problem of the absence of the methodology required.

Since both criteria met, continue to the next step.

The purpose has been shown to faculty member colleagues, which have understood how comprehensive quality improvement whether or not initiatives are done

in an intuitive basis, and have confirmed it is done that way. A professor stated that he attends several meetings with the purpose of improvement, however not any formal methodology is used, but just common sense.

With the findings obtained about the lack of research and the absence of the TQM methodology, and confirming as was stated in the motivation of this study, the need of universities to improve and also to increase accountability and simultaneously play the fundamental role of universities in the development and good impact on the society, the researcher is very committed with the purpose chosen.

4.2.3 Test the purpose by the following criteria.

4.2.3.1 Is the purpose desirable?

Answering the question with rationale, the purpose is worth having, since it will not only satisfy the stated need and the absence found but also will solve the root problem which is to strengthen the university since it will have a significant beneficial impact in the society and stakeholders. As indicated in the Literature Review, the improvement of education has a significant impact in the development of communities, and higher education is the centerpiece of the educational system of a society.

Discussing with a group of students, they mention the university as an organization does not provide the good level of service that other organizations provide: restaurants, shopping centers, logistics companies, etc. the majority of companies and institutions provide service with a customer-oriented focus, whereas in the university it seems as if priorities are not clear, and students are not perceived and neither treated as the center of the university.

Discussing with a group of professors, they cite the lack of services support from the University. In both, teaching and research activity there are several occasions where faculty does not receive the necessary support from university processes, for example in using software and systems for clerical work or account per diem. Faculty prefer to focus on their students and investigations rather than participating in complex and often bureaucratic processes.

Discussing with university alumni, they mention that universities are perceived as slow and bureaucratic. It is hard for universities to undertake new initiatives, go to a different pace. With the exception of business schools, the quality of services they experience from the universities is low; which is perceived for example when graduates return to college for a graduate or extension course. Other case is when it requires a joint venture between a university and a company; this is an area which also receives a different dynamic, slower, more timid.

These answers from diverse groups which know the university, confirm that purpose is desirable, in other words, it's worth the purpose of developing a methodology for the integral quality improvement of university.

4.2.3.2 Is the purpose operationalizable?

Analyzing the purpose of: "to develop a TQM Methodology for universities, which will lead to the preparation of a TQM Plan", concepts such as, "TQM", "universities" and "plan" are found. All these are operationalizable.

Using as a reference the "operationalization of fuzzy concepts" (Benedict, 1974), the concepts would have to be broken down until these can be observed or measured, and thus are no longer fuzzy. In this study as stated in the literature review, we will use TQM.

As indicated, operationalizing TQM, the quality program will be comprehensive, i.e. for the university as a whole, not just for one area, focusing on both macro processes of the university, i.e. teaching and research. Together with these two macro processes, we have the general support processes. These three macro processes, give us a set of factors and critical areas of quality that can then be operationalized, that is observable and measurable. Quality as a concept also is operationalized, to the extent that it translates into attributes that are measurable and observable. Finally, management is also measurable and observable in that it breaks down into specific actions. In short, a TQM effort is feasible to be observable and measurable. As for universities, also as indicated in the literature review, to become a university, simply is enough to declare themselves as such. However, in the scope of this study, it has been clearly stated, that the methodology will be developed and therefore designed to be suitable for universities which teach at undergraduate and graduate level as well as produce knowledge-through research. This is also observable and measurable, and can be operationalized, i.e. a set of attributes for the university is within the scope of this study. Finally also Plan is an operationalizable concept. It should be established what are the minimum components that can be recognized as a plan, and is the result of a real planning into a comprehensive quality effort where everyone is involved, and is appropriate for the nature of an organization such as university with its peculiarities.

Checking if the purpose is desirable in light of operationalization, again it is possible to operationalize, since it is possible to operationalize the need for a TQM plan, pursuant to which can be observed or Measure. It is also possible to measure the impact of improving the quality of the university.

4.2.3.3 Is the purpose practicable?

Yes the purpose is capable of being done given the purpose. It is feasible to construct a methodology for a university organization that would lead to the making of a TQM Plan. This should be done breaking the problem down into pieces. However, it should be clearly stated in the scope that it is not in any TQM Plan, but one made specifically for universities, reflecting the peculiarities of academic institutions and also, more importantly, gathering the needs and challenges of the university in particular for which TQM Plan is developed. You can develop as many TQM Plans, as universities exist, although it aims to standardize and test a methodology applicable to any university, resulting TQM Plan will also be unique.

The methodology that will be developed will have a practical approach, although the problem and the university organization are complex, the methodology must be simple, to ensure its application.

Discussing with methodologists about how practical is the development of this methodology, they state that it is practicable, since it is feasible of being developed provided that it will adapt to the situation of a particular university. Quality in education and quality in research are complex concepts, and require a definition by the university in order to be operationalizable as well as practicable.

Discussing with potential users, that is professors of universities, they also find it practicable, although they point out the need of involving the different users so faculty members and the university entities participate in the development of the TQM Plan otherwise it would not be likely of implementation in the whole university organization.

4.2.3.4 Are existing methodologies insufficient?

Yes, there is no evidence of research on methodologies for the application of TQM in universities. The topics related are Accreditation schemes such as ABET and SAC criteria, and quality models such as ISO 9000, Baldrige and Six Sigma. However these do not provide methodologies for the development of a TQM Plan. Moreover, Six Sigma provides a methodology, however it is designed to accomplish a different purpose, do not accomplish the purpose indicated in this study.

4.2.4 If the answers are affirmative, analyze the implications of the purpose

4.2.4.1 Use the method to analyze implications

Imagine and write down in what ways could you fail to accomplish the purpose. One way of failing would be to develop a methodology that does not conform to a university organization, and not consider its characteristics. Therefore it might be the case in which the methodology is appropriate for an organization other than the university, which does not consider the complexities in the activities of producing graduates and producing knowledge through research, or do not consider that universities have considerable autonomy to their authorities such as Deans or Department Chairs.

Another way of failing would be that the methodology does not consider the need to build consensus and commitment, socializing TQM Plan for involving stakeholders. It is known that in the universities, when a project of this type with significant impact and involving change is not socialized enough and does not consider feedback, the program is ignored or rejected by the university community. Moreover in a case of TQM is needed

to involve as many actors as not to give this figure to involve participants then maybe something can be improved, but it will not be TQM.

To avoid the first case, it is necessary to focus on the methodology to suit the type of university organization and leave open the possibility of including the particularities of the specific university you want to apply the methodology.

One should think that the methodology meets the planning, in other words the focus is to prepare a plan and avoid the possibility of implementing a solution immediately. Remember that the TQM Methodology is to develop the plan, based on a good diagnosis and a situational analysis with the different actors in a university: professors, researchers, administrators, officials, staff and stakeholders including students. When the purpose is being accomplished then the university is a good analysis of current situation and clearly defines what is the current quality and quality to which you want to reach and involve different stakeholders of the university community to make a comprehensive quality plan.

Following the meta-methodology and making a single list, it should be included the different expectations of key stakeholders and top management. In developing the methodology should keep in mind the peculiarities of an organization like the university. It should also be clear that the methodology is meant for the planning phase, so you should avoid shortcuts that lead to an immediate improvement, as the methodology seeks to do a systemic effort based on a sound diagnosis and ensuring that it is a participatory plan to make certain that TQM can be achieved. At a university where a plan is perceived as mandatory, then resistance to change is increased significantly.

4.2.4.2 Organize the attributes in a rational order of steps.

The implications that are not necessary are the ones related to lack of participation of key actors and stakeholders. The first implication is to have a good situational analysis, in order to initiate. The definition of quality for the university is required as a common ground for any improvement. Also the profile of the university is needed as well as the strategic intent, which is the purpose that the university strives.

Once the previous implication is accomplished, the quality dimensions of the university should be defined and assessed. Next it should be investigated what is the current state for each of the quality dimensions defined, in order to understand the current overall quality level, and formulated the desired future quality level.

When the previous implication is accomplished, the causes of the current situation should be analyzed. For this matter, it should be noted that the quality levels are a result of the processes involved. Next the main or significant areas for improvement should be prioritized in order to select the ones which will cause a major impact.

Once the previous implication is accomplished, a plan should be prepared in the prioritized areas, involving the key actors to organize an overall total quality management initiative. This plan should include areas for improvement developing an improvement project for each area.

When the previous implication is achieved, the Plan should be adjusted and should be accepted not only by the formal authority, that is University CEO, but also accepted by the university community including the stakeholders.

Checking with other methodologists and specialists in quality management in universities, the order of initiation, then assessment, next analysis, then preparation of

TQM Plan, and finally gaining acceptance of the plan is appropriate since it follows a logic sequence of planning including the implications discussed in this section of this study. The final list of the methodology is initiation, assessment, analysis, preparation and acceptance.

4.2.5 Operationalize the purpose

The purpose of: “to develop a TQM methodology for universities, which will lead to a preparation of a TQM Plan”, the concepts of “TQM”, “universities” and “plan” have been operationalized using the operationalization of fuzzy concepts, TQM indicates that the quality program will be integral, considering all areas of the university, referring to the two main macro-processes: teaching and research. Quality has also been operationalized since it has been translated into attributes measurable and observable referred to as quality dimensions. Management has been operationalized breaking it down to pieces. With respect to universities it has been operationalized in the sense in which it has been designed to be suitable for universities which teach at undergraduate and graduate level as well as produce knowledge through research.

4.2.6 Design procedures.

Identify the first step to be designed, and then identify the step’s sub purpose. Analyze the implications of sub purpose in terms of main purpose.

The first step to be designed is the Initiation step. The sub purpose of it is to have information from University and preliminary agreement of scope, goals and stakeholders for the TQM Plan. Failure to accomplish this sub purpose would be, if it cannot have the latest information, or do not get to decide what the scope would be, for example if you

only do a number of diagnoses without reaching decisions. Similarly, is to define and agree on goals for TQM Plan. It would be even worse if it is not managed to identify the stakeholders because they are the ones who are going to give final shape to the priorities of the TQM Plan. In order to avoid the problems and accomplish the purpose, it should be the key players to access the various information sources in order to have updated information on the status of the university. In the same way, the sponsor and initiator of the project should be identified, along with a clear proof of the need to enable us to have a preliminary agreement of the scope of the program as well as the goals. In the case of stakeholders should convene a multidisciplinary team with good knowledge of the university, to identify all the stakeholders involved to the extent that the university is an organization not only complex but multiple services offered by which each service may have different systems or groups of stakeholders. When the sub purpose is being accomplished, it manages to make a good diagnosis of the current situation of the university, the organization being known comprehensively. It also identifies the need to improve the quality of the university and therefore makes a good outline of the scope of the program which leads to the establishment of quality goals aligned with the scope and needs of stakeholders. There is also a detailed map of the stakeholders, identifying a subset of them for each line of service offered by the university.

The next step to be designed is the Assessment step. The sub purpose of it is, to identify the quality dimensions and baseline and evaluate state of the art in quality. Failure to accomplish this sub purpose would be unable to define for each area of work of the university, teaching, research and general, what are the quality dimensions, or that was not possible to determine exactly how our quality is today. In order to avoid the

problems and accomplish the purpose, they must form a participatory group that knows all areas of the university, and in conjunction with Top Management will develop a comprehensive list of priorities as in college and is achieved details precisely what is perceived as important by the community college. Additionally, should convene objective and reliable sources to make a survey of information and have a real figure as possible of the situation at the present time, before any improvement is to serve as a baseline to measure and assess the level of future quality in our university. When the sub purpose is being accomplished, a job is done efficiently and directly identifying each of the quality dimensions, especially having a greater impact on the quality of university services and thus in stakeholders. Draw a baseline that will help in any study so that it applies a quality initiative and we have a "calibrated instrument" that will measure our position in the future and will determine whether it has improved or not and could even indicate whether it has improved or deteriorated, in what has been achieved this. Knowing exactly where we are today gives us the confidence to perform various interventions, and some of them improve

The next step to be designed is the Analysis step. The sub purpose of it is, to study and verify the causes of the current quality levels, and select the significant areas for improvement. Failure to accomplish this sub purpose would be unable to understand what is it that causes the current quality levels and therefore not being able to identify which is something that must be changed, improved or removed to achieve quality improvement. The causal relationships enable us to understand the logic of what is undesirable and therefore can be corrected at the source. Additionally, not being able to identify the significant areas for improvement would not allow developing a TQM Plan, because it

would not be accurately identified that over which should act or improve at micro level to perceive it at macro level. In order to avoid the problems and accomplish the purpose, you must identify those processes that have an impact on the quality levels of the university and consequently what are the independent variables and the dependent variables in that process. Calling people who closely know the processes, then can identify what are the causes of undesirable effects and therefore these variables are improved or removed. Additionally, again with people, who know the university and identifying the stakeholders, is possible to prioritize areas for improvement of the university. Universities are complex organizations, and therefore would not be feasible to complete a TQM plan with a very high number of areas for improvement, this is the reason why you should prioritize and launch a TQM Plan with a reasonable number of projects and activities to work on. When the sub purpose is being accomplished, identify the cause-effect relationships, and you can even do tests to verify these causal relationships in each process associated with the services and stakeholders, and improvements are made and measure the effect, even incorporating a continuous improvement process. Also, when you prioritize and identify areas for improvement can be selected projects as Juran mention the vital few, i.e. those few areas of improvement which would have a major impact in the university.

The next step to be designed is the Preparation step. The sub purpose of it is, to prepare the final draft of a TQM Plan including the selection of improvement projects, roles and responsibilities. Failure to accomplish this sub purpose would be unable to compile a plan to be adjusted and tuned. It is important to have a first complete version of TQM Plan to eventually be improved to take its final shape. Besides would not have

selected the projects and therefore would be very difficult to drive a TQM plan with a very high number of projects. TQM Plan as a whole would suffer and the risk of failure would be high. Nor have defined responsibilities and roles that are absolutely essential in the TQM Plan, which should be participatory to ensure its final implementation. In order to avoid the problems and accomplish the purpose, it must be from the beginning gathering information and start preparing the document and the template of TQM Plan, until you can include as much information as required and may have a first complete draft of the TQM Plan. Moreover, you should engage experts to objectively identify priority areas for improvement and therefore this is not governed by other criteria such as political, but prioritizes the areas that have the greatest impact, in other words that involve more direct stakeholder needs. In addition this ought to be a participatory program for faculty members and staff fulfill the roles and carrying out the responsibilities required and by a program of this magnitude. When the sub purpose is being accomplished, there is progress in the work of TQM Plan document obtaining improved versions that collect feedback every time a more accurate and involves the largest number of players generating consensus on the need to implement this plan. It has a list and a ranking of the improvement projects including the leaders of the same and clearly stated who does what in each project and the TQM Plan, including expectations and a reward system.

The final step to be designed is the Acceptance step. The sub purpose of it is, to Communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO. Failure to accomplish this sub purpose would be not communicating the TQM Plan, not to seek

feedback and thus reduce the chance of building consensus and agreement on the need for this plan and its benefits.

If there is no commitment or support from key professors and staff, the TQM Plan will not be feasible to implement, or even may be approved, perhaps they can produce many versions many versions of TQM Plan, each better than the last, but if you do not see the commitment of key actors and these spread to others and building a consensus on the need and the positive improvement, the TQM Plan may never be approved, or worse it could be even be approved, but never would exist the conditions and environment for implementation. in order to avoid the problems and accomplish the purpose, communication from a fundamental principle, generating feedback and encouraging participation including major elements and also to generate consensus and the participatory and inclusive of TQM Plan. Involving the faculty members and key stakeholders, leading to obtain a written authorization, are both required to start the implementation phase. When the sub purpose is being accomplished, there will be an institutional expectation of the need and the goodness of having a TQM Plan, a climate to encourage the faculty members, staff and key stakeholders to state their opinions and suggestions, knowing they will be incorporated if they are useful, and ensuring that the TQM Plan is drawn up by the largest number of participants, which will be a participative TQM Plan and the commitment needed to further ensure the latest version, and having a document and a high quality plan, while the consensus and knowledge of it, then the CEO of the university will have the best conditions for trust and risk to begin the implementation phase of TQM Plan which goes beyond the scope of this study

Following with the methodology, the steps of each of the main steps of Initiation, Assessment, Analysis, Preparation and Acceptance are as follows. By using the meta-methodology, we will be covering the planning cycle of the Plan-Do-Check Act, in other words, it is the P in P-D-C-A, which has been accomplished in five steps, and not four or six, with these five, the purpose is accomplished.

4.2.7 Test and revise the purpose and/or procedures if necessary

Revising the purpose again, according to the meta-methodology, the development of a TQM Methodology for universities, which will lead to the preparation of a TQM Plan, is suitable for providing a good result.

4.3 TQM Methodology for the quality improvement of universities.

Using the meta-methodology of seven steps, the TQM Methodology is developed. It includes a methodology in phases. For each phase is included a purpose, description, key activities, deliverables and tools.

The proposed methodology is called IAAPA, which stands for Initiation, Assessment, Analysis, Program and Acceptance.

Figure 12 shows IAAPA A0 model and, Figure 13 shows IAAPA process flow.

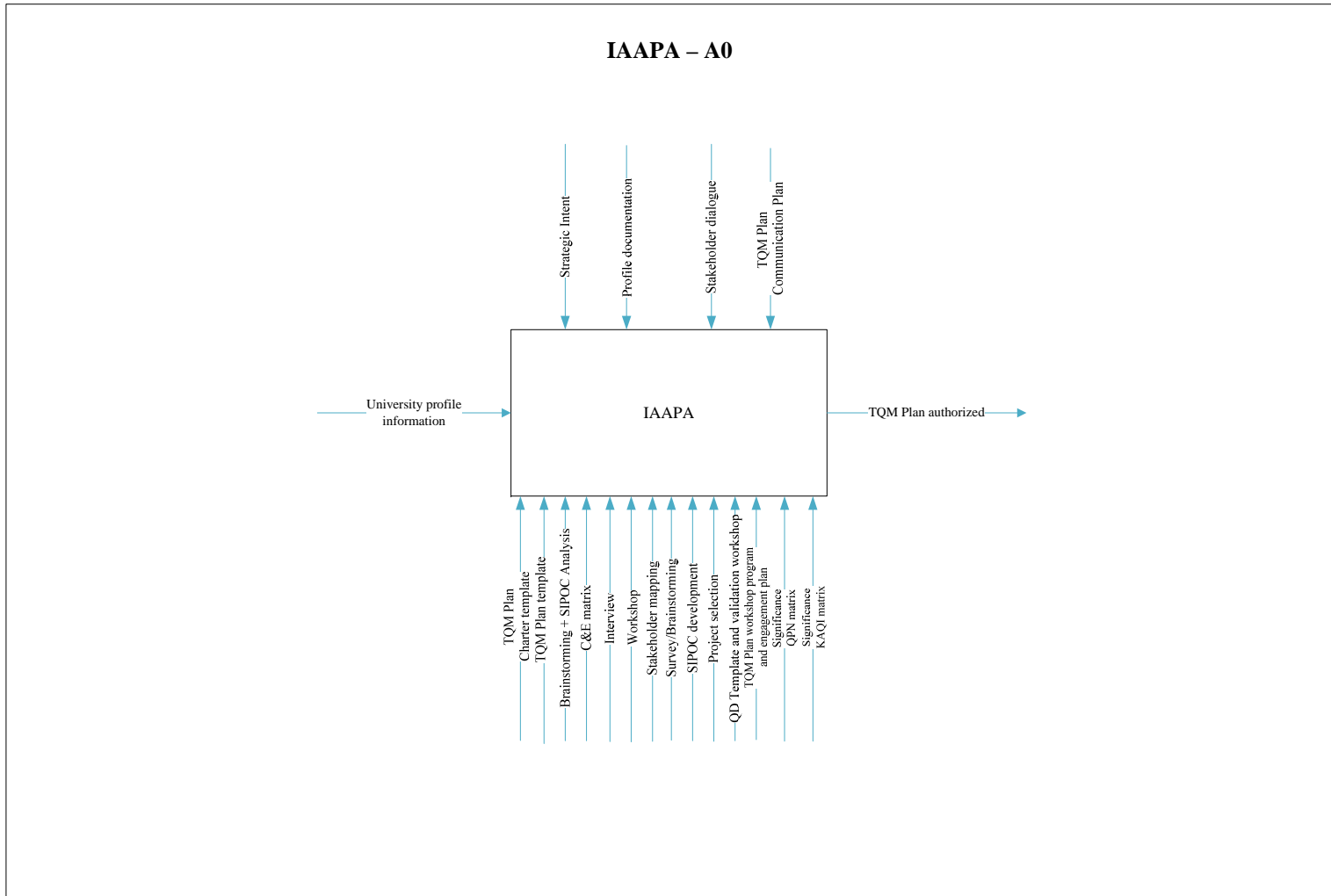


Figure 12: IAAPA-A0

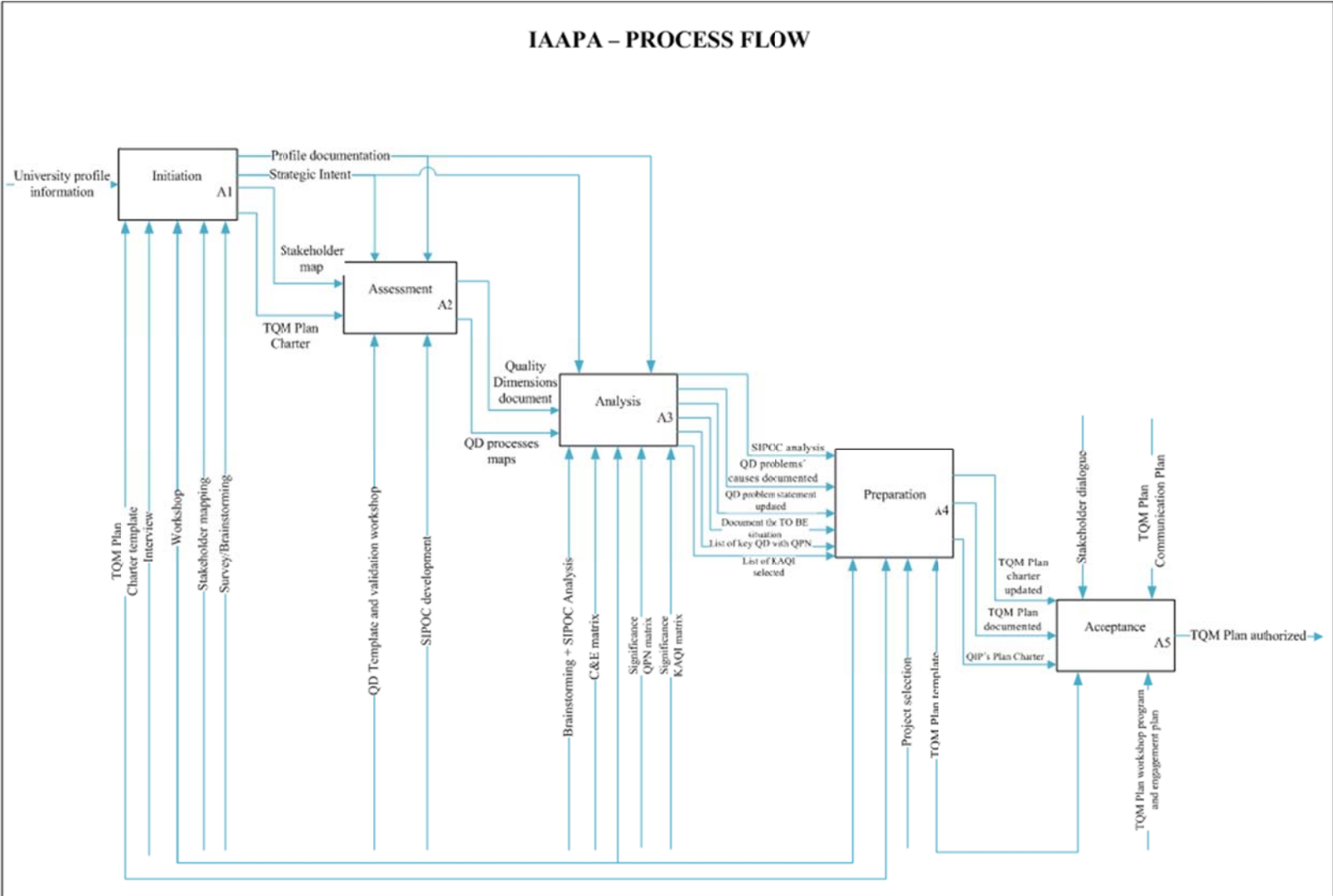


Figure 13: IAAPA - Process flow

Table 2: IAAPA

| | INITIATION | ASSESSMENT | ANALYSIS | PREPARATION | ACCEPTANCE |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PURPOSE: | To have information from University and preliminary agreement of scope, objectives and stakeholders for TQM Plan. | To identify the Quality Dimensions and baseline and evaluate state of the art in quality. | To study and verify the causes of the current quality levels and select the significant areas for improvement | To prepare the final draft of TQM Plan including selection of improvement projects, roles and responsibilities. | To communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO. |
| DESCRIPTION: | <ol style="list-style-type: none"> 1. University profile, its context and strategic intent. 2. University identifies the community to which the services are aimed to, stakeholders. 3. University definition of quality in education and quality in research. 4. Proof of the need: why improve. Drivers for improvement | <ol style="list-style-type: none"> 1. Understand the current state of the quality of university education and research. 2. Measure the current state of the quality of the university. 3. Define what level of quality the university aims to achieve as well as its benefits. | <ol style="list-style-type: none"> 1. Analyze the causes of the current status of quality, identifying the processes involved and their roles. 2. Define Key Areas for Quality Improvement. | <ol style="list-style-type: none"> 1. Update TQM Plan Charter 2. Define and Develop improvement projects (QIP) associated with each KAQI in a program. 3. Define roles and responsibilities 4. Document TQM Plan. | <ol style="list-style-type: none"> 1. Communicate properly the TQM Plan to involve the university community. 2. Obtain authorization from the authorities to advance to TQM Plan implementation and have collective acceptance to ensure success. |
| KEY ACTIVITIES: | <ol style="list-style-type: none"> 1. Collect state of the art information of the university. 2. Document and update the strategic intent. 3. Create and validate the stakeholder map. 4. Develop and update quality definitions. 5. Prepare the first draft of TQM Plan Charter (including proof of the need) | <ol style="list-style-type: none"> 1. Validate QD and describe the state of the art. If applicable, define a QD problem statement. 2. Assess the state of the art in each QD: H,M,L 3. Build the proposed To-Be situation in each QD. 4. Identify the processes associated with each QD, including inputs, outputs and process factors. | <ol style="list-style-type: none"> 1. For each QD, analyze the process flow and generate ideas to explain potential causes of undesired as-is situation. 2. For each QD, select the main possible root causes. 3. Update problem statement for each QD. 4. Identify KAQI by prioritizing QD | <ol style="list-style-type: none"> 1. Update and validate TQM Plan Charter. 2. Devise a QIP (including QIP charter) for each KAQI. 3. Prepare the final document of the TQM Plan. | <ol style="list-style-type: none"> 1. Create communication plan, selecting key actors for feedback. 2. Communicate TQM plan and ask for feedback. 3. Review and update TQM plan with feedback collected including proof of the need statement. 4. Obtain Commitment from Top Management and key actors. 5. Obtain written authorization for TQM Plan implementation. |
| DELIVERABLES: | <ol style="list-style-type: none"> 1. Profile documentation: Mission, Vision, Values, Services provided, stakeholder focus, governance system, faculty and staff, key resources, success indicators. 2. Strategic intent. 3. Stakeholder map. 4. Quality definitions in education and research. 5. TQM Plan charter (problem statement, quality goals, scope, timeline, roles and responsibilities) | <ol style="list-style-type: none"> 1. Quality Dimensions document. 2. Gap study: Baseline As-Is and To-Be. 3. Measurement in each Quality Dimension. Measure (High,Medium,Low) 4. Maps of processes associated with QD | <ol style="list-style-type: none"> 1. SIPOC analysis. 2. Documentation of the possible causes of quality problems. 3. QD problem statement updated. 4. List of key QD with priority (QPN). 5. Define Key Areas for Quality Improvement (KAQI). | <ol style="list-style-type: none"> 1. TQM Plan charter updated. 2. TQM Plan documented. | <ol style="list-style-type: none"> 1. TQM Plan Communication Plan. 2. Feedback document 3. TQM plan updated and final document. 4. TQM Plan authorized. |
| TOOLS: | <ol style="list-style-type: none"> 1. Interview. 2. Workshop (SI). 3. Stakeholder mapping. 4. Survey/Brainstorming. 5. TQM Plan Charter template (including proof of the need statement). | <ol style="list-style-type: none"> 1. QD Template and validation workshop / Interview state-of-the-art 2. Scoring template. 3. To-Be Workshop. 4. SIPOC development. | <ol style="list-style-type: none"> 1. Brainstorming + SIPOC Analysis. 2. C&E matrix. 3. Problem statement TQM Plan template. 4. Significance QPN matrix. | <ol style="list-style-type: none"> 1. TQM Plan charter template / update workshop. 2. Project selection (including Project Charter template). 3. TQM Plan template. | <ol style="list-style-type: none"> 1. TQM Plan communication template. 2. Stakeholder dialogue. 3. TQM Plan template (updated). 4. TQM Plan workshop program and engagement plan. |

4.3.1 Initiation

The purpose of this phase is to have information from University and preliminary agreement of scope, objectives and stakeholders for the TQM Plan.

4.3.1.1 Description

1. University profile, its context and strategic intent.
2. University identifies the community to which the services are aimed to, stakeholders.
3. University definition of quality in education and quality in research.
4. Proof of the need: why improve? Drivers for improvement.

4.3.1.2 Key activities

1. Collect state of the art information of the university.
2. Document and update the strategic intent.
3. Create and validate the stakeholder map.
4. Develop and update quality definitions.
5. Prepare the first draft of TQM Plan Charter (including proof of the need).

4.3.1.3 Deliverables

1. Profile documentation: Mission, Vision, Values, Services provided, stakeholder focus, governance system, faculty and staff, key resources, success indicators.

2. Strategic intent.

3. Stakeholder map.

4. Quality definitions in education and research.

5. TQM Plan charter (problem statement, quality objectives, scope, timeline, roles and responsibilities).

4.3.1.4 Tools

1. Interview.

2. Workshop (SI).

3. Stakeholder mapping.

4. Survey/Brainstorming.

5. TQM Plan Charter template (including proof of the need statement).

Figure 14 shows the Initiation phase process flow using IDEF0.

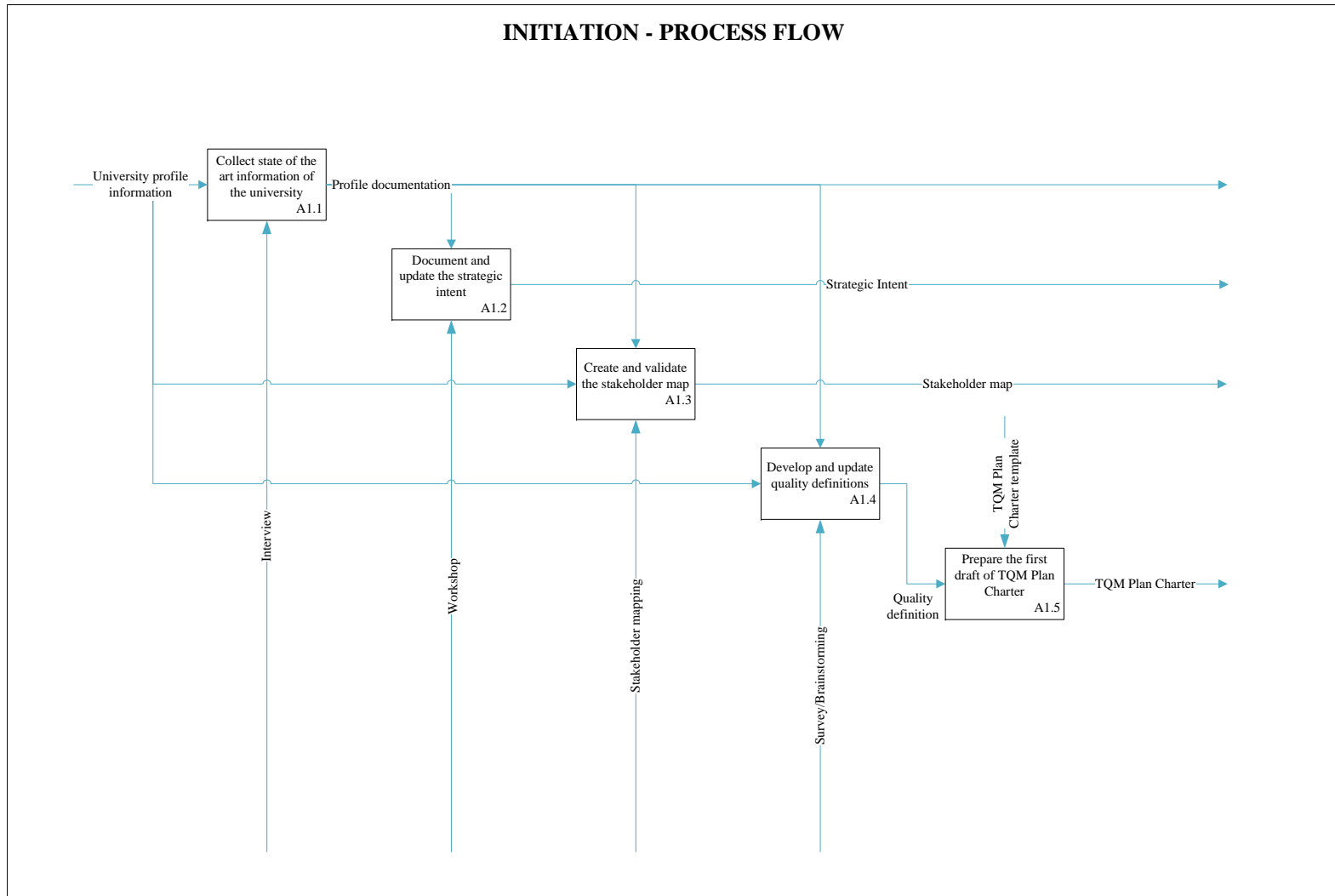


Figure 14: Initiation - Process flow

Table 3: Initiation tools

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| Interview. | A formal meeting in person, especially one arranged for the assessment of the qualifications of an applicant. It's to gather information about certain activities of the university. | According to the information needs | Ask specific questions of how to perform the activity. | F/001 Verification List (Figure 20) |
| Workshop (SI). | Seminar in which the participants work individually and/or in groups to solve actual work related tasks to gain hands-on experience. This workshop is made with the heads of the units of the university | When you want to analyze information in conjunction with process owners in order to make decisions. | Business meetings to analyze problems, set objectives, and define and design the solution are best practice way to quickly create stable and high quality requirements. | F/002 Workshop Meeting Minutes (Figure 21) |
| Stakeholder mapping | Is a strategic business tool which identifies and assesses the effect of a different individual or group of stakeholders in a company. It examines the power stakeholders can exert, the relative likelihood of them using that power, and their level of interest regarding the company's activities. | It allows the company to assess ways to improve its communication based on proven interest of stakeholders. For example a stakeholder who is greatly interested, but exercises little power, may only require a newsletter to keep them informed of company events. Alternatively, a major | Identify the organization's various external and internal stakeholders, typically through a brainstorming session. On the stakeholder map, place of the University at the center and place the identified stakeholders around it. If possible, place the stakeholders in a logical pattern on the map, for example: suppliers on the left-hand side, | F/003 Stakeholder maps (Figure 22) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| | <p>The goal of the analysis is to gauge which stakeholder or group of stakeholders has the greatest potential to affect the company and therefore decide which stakeholders will need particular attention</p> | <p>shareholder, wielding both power and interest, may demand direct involvement in any big company decisions, such as direct voting at an Annual General Meeting. By analyzing the different groups of stakeholder, companies can prioritize and focus their efforts to maximize the effectiveness of their stakeholders' interest and power on big strategic decisions.</p> | <p>customers on the right, “superiors” like owners, authorities, and so forth, above, internal stakeholders grouped together, and so on. Use arrows to visually link the stakeholders to the University. Analyze the needs and expectations held by the stakeholders, again either by brainstorming or in some cases by actually asking them directly. Include at least the most important expectations of each stakeholder in the map by listing them along the arrows linking them with the University. Asses the position of the stakeholders toward of the university, color the different stakeholders on the map.</p> | |
| Survey/Brainstorming. | <p>Is a group work tool that facilitates the emergence of new ideas</p> | <p>Whenever your group wants to make sure a range of ideas are considered, including:</p> <ul style="list-style-type: none"> • Completing elements in a project charter • Identifying customers to include in research | <p>Conduct review meetings.</p> <ul style="list-style-type: none"> • Review the problem definition • Clarify the goal/question and provided any relevant information • Give everyone a few minutes of silence to think about the | <p>F/004 Meeting Minute (Figure 23)</p> |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| | | <ul style="list-style-type: none"> • Identifying potential causes to investigate • Identifying types of data to collect • Identifying solution ideas | <p>question and individually write down some ideas</p> <ul style="list-style-type: none"> • Consolidate similar ideas discuss the complete set of ideas. Use other tools as appropriate to find patters, use affinity diagrams or cause-effect diagrams and to narrow down or prioritize items. | |
| TQM Plan Charter template | <p>It is a tool that describes all interactions of the project and sets the stage for a successful completion. Explains ten elements of TQM implementation.</p> <p>In the TQM Plan you will see the main functions at work in the university; these are the areas that will contribute to the overall completion of the final product.</p> | <p>Budgets and timeframes are integral elements of project management and are often the key elements used when assessing a project's performance.</p> <p>This process will focus on the quality that is happening company wide.</p> | <p>When will take a great deal of effort, time and work. This will be work from every contributing person in the company. The only way this program can work is with each person working together in consistency</p> | F/005 TQM Plan (Figure 24) |

4.3.2 Assessment

The purpose of it is, to identify the Quality Dimensions and baseline and evaluate state of the art in quality.

4.3.2.1 Description

1. Understand the current state of the quality of university education and research (AS- IS).

2. Description of the current state of the quality of the university.

4.3.2.2 Key activities

1. Validate QD and define which of them applied to the university and define a QD problem statement.

2. Identify the processes associated with each QD, including inputs, outputs and process factors.

4.3.2.3 Deliverables

1. Quality Dimensions document.

2. Maps of processes associated with QD.

4.3.2.4 Tools

1. QD Template and validation workshop.

2. SIPOC development.

Figure 15 shows the Assessment phase process flow using IDEF0.

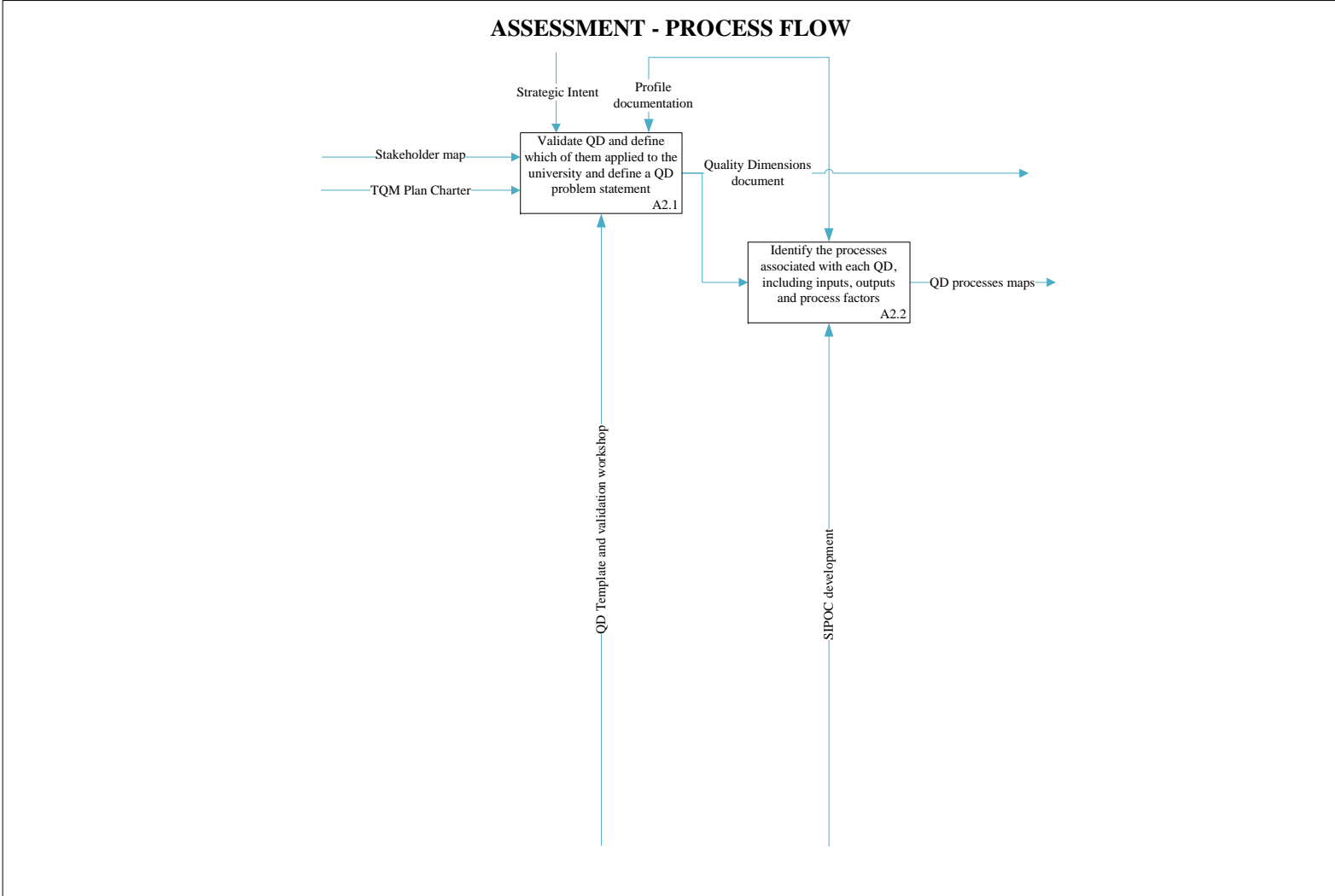


Figure 15: Assessment – Process flow

Table 4: Assessment tools

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|----------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Quality Dimension Template | Provide a good conceptual framework for understanding the multidimensional nature of product quality. | Use the dimensions to measure the quality of a particular product, the dimensions must be operationalized, that is measureable characteristics (metrics) must be defined which enable an assessment of the dimension they represent. | A number of researchers have shown that service quality is also multidimensional. It is harder to find one set of quality dimensions which apply equally well to many types of services. It is often necessary to develop appropriate service quality dimensions on a University. Operationalizing the dimensions of service quality is frequently more challenging than operationalizing the dimensions of product quality. | F/006 Quality Dimensions (Figure 25) |
| Validation Workshop | The objective of the checklist is to assist the organizers of the validation workshops as they prepare | To confirm the initial workshop | Review range of potential participants, professionals, women’s groups, youth groups, traditional leaders, religious leaders, business groups, regional administration and parliamentarians, local NGO consortium, etc. Selection of participants – aligning criteria with elements in Concept Note, conferring with Core Coordinating Group Preparing participants to be actively | F/007 Validation Workshops minute (Figure 26) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| | | | involved (pre-workshop briefings, etc.) Facilitating vibrant discussions (translation, interpretation, structure of breakout groups vs. plenary discussions, etc.) | |
| Interview state-of-the-art | A formal meeting in person | To map the state of the art. | Using process map. Obtain a general understanding of the flow of process step. Prepare training materials. Identify areas in need of improvement. Analyze the cost structure of a process. Understand the University place in its surroundings and link to other actors. | F/008 Chart flow process (Figure 27) |
| Scoring template | Evaluation of performance by assigning a grade or score This method will help you quantify your values and make fast decisions between alternatives. | To qualify a type of feature | It applies to everything from which mortgage professional should I choose to which alternative you should select. | F/009 Scoring Template (Figure 28) |
| To-Be Workshop | seminar in which the participants work individually and/or in groups to solve how to be the process in the University | when you want to do a redesign of processes in order to use the best practices | Construction a map process according to: <ul style="list-style-type: none"> • Who should be involved? • How should they be involved? • How much time can you spend on the task? • What are the relevant sources of | F/002 Workshop Meeting Minutes (Figure 21) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|-------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| | | | information? <ul style="list-style-type: none"> • What level of detail should be used? | |
| SIPOC development | A process snapshot that captures information critical to a project. | SIPOC diagrams help a team and its sponsor agree on project boundaries and scope. And helps teams verify that process and inputs/expectations of downstream process. | It works best to identify the process steps you're concerned with because that defines boundaries, then move on to outputs/customers, and back to suppliers/inputs. But do them in any order that makes sense for your project. <ul style="list-style-type: none"> • Identify process boundaries and key activities • Identify the key outputs (Ys) and customers of those outputs • Identify inputs (Xs) and suppliers • Identify critical-to-quality requirement for the inputs, process steps, and outputs. Be very specific about where the process starts and ends. This should align with the scope of the project. | F/010 SIPOC (Figure 29) |

4.3.3 Analysis

The purpose of it is, to study and verify the causes of the current quality levels, and select the significant areas for improvement.

4.3.3.1 Description

1. Analyze the causes of the current status of quality, identifying the processes involved and their roles.
2. Build the proposed TO-BE situation in each QD.
3. Analyze the quality level of the state of the art, the impact to quality and the alignment to each of selected QD (QPN).
4. Identify the Key Areas for Quality Improvement (KAQI).

4.3.3.2 Key activities

1. For each QD, analyze the process flow and generate ideas to explain potential causes of undesired AS-IS situation.
2. For each QD, select the main possible root causes.
3. Update problem statement for each QD.
4. Build the TO-BE situation
5. Qualify each QD with a level of “AS-IS”, impact to quality and the alignment to the Strategic Intent: low (1), medium (3) and high (5).
6. Define Key Areas for Quality Improvement (KAQI).

4.3.3.3 Deliverables

1. SIPOC analysis.
2. Documentation of the possible causes of quality problems.
3. QD problem statement updated (TQM plan)
4. Document the TO-BE situation (TQM plan)
5. List of key QD with priority (QPN).
6. List of the KAQI selected.

4.3.3.4 Tools

1. Brainstorming and SIPOC Analysis.
2. C&E matrix.
3. Problem statement TQM Plan template.
4. Workshop
5. Significance QPN matrix.
6. Significance KAQI matrix

Figure 16 shows the Analysis phase process flow using IDEF0.

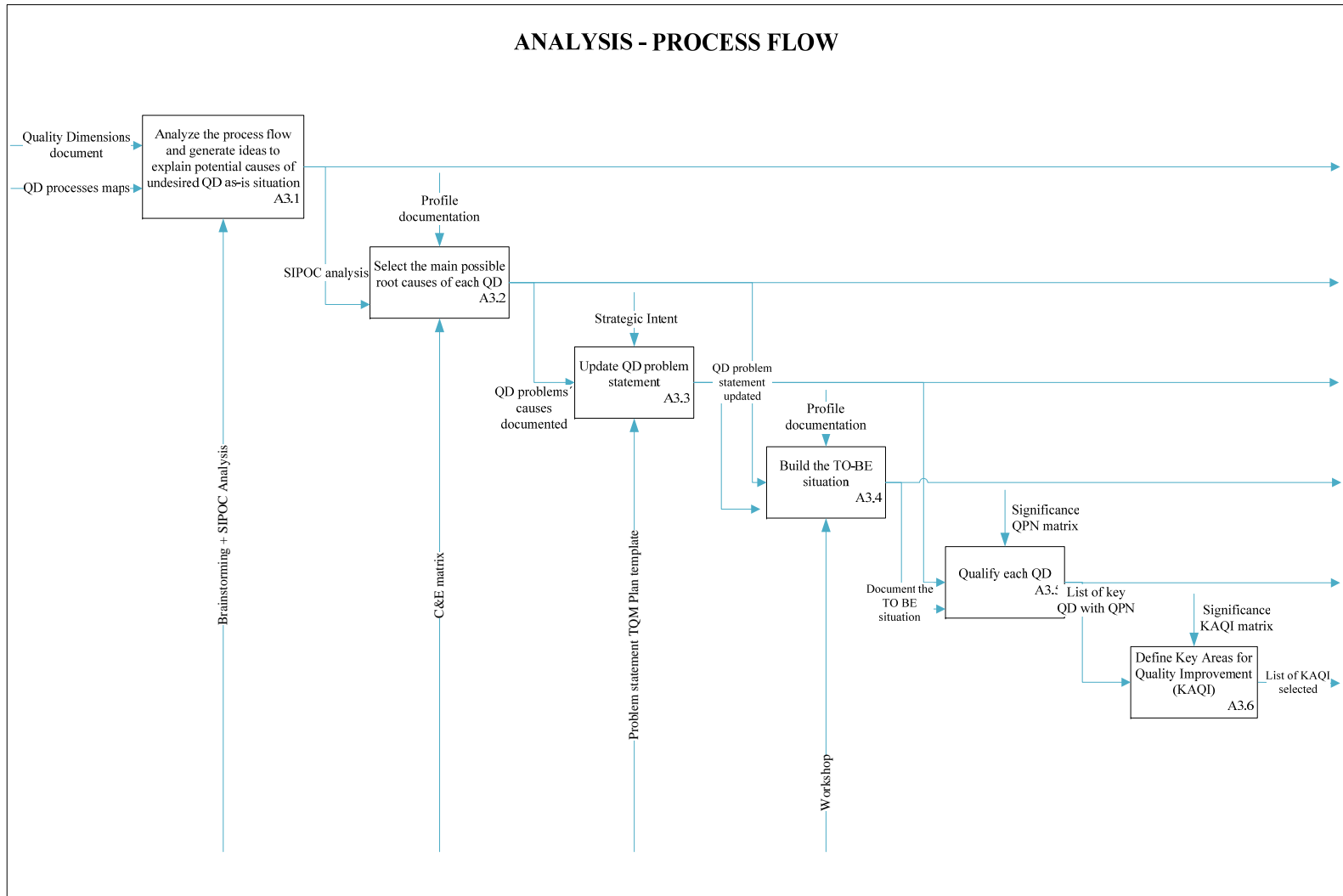


Figure 16: Analysis - Process flow

Table 5: Analysis tools

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|----------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Brainstorming | Provide a group with a wide range of ideas around any topic. | Produce many ideas or solutions in a short time, stimulates the creative thinking process, and helps make sure that all group member's ideas are considered. | <p>Go for quantify (not necessarily quality) in the rounds</p> <p>Allow individuals to complete their thoughts</p> <p>Build on existing ideas</p> <p>Be brief when stating an idea</p> <p>Organize, categorize and evaluate only after the brainstorming session</p> <p>Keep the self-stick notes even if you transcribe ideas onto a flip chart (the self stick notes can be reused for creating an affinity diagram.</p> | F/004 Meeting Minute (Figure 23) |
| SIPOC Analysis | A process snapshot that captures information critical to a project. | Helps teams verify that process and inputs/expectations of downstream process. | <p>Identify process boundaries and key activities:</p> <ul style="list-style-type: none"> • Keep at a high level, with perhaps six activities at most <p>Identify the key outputs (Ys) and customers of those outputs:</p> <ul style="list-style-type: none"> • Brainstorm outputs and customers • If you have a lot of different | F/010 SIPOC (Figure 29) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|------------|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| | | | <p>outputs and customers, focus on a critical few</p> <p>Identify inputs (Xs) and suppliers</p> <ul style="list-style-type: none"> • Brainstorm inputs and suppliers • If you have a lot of different inputs and suppliers, focus on a critical few. <p>Identify critical-to-quality requirement for the inputs, process steps, and outputs.</p> <ul style="list-style-type: none"> • Verify this later with data collection. | |
| C&E matrix | To identify the few key process input variables that must be addressed to improve the key process out variable. | <p>Similar in purpose to a fishbone diagram, but allows you to see what effect, various inputs and outputs have on ranked customer priorities.</p> <p>Use in Improve to pinpoint the focus of improvement effort.</p> | <p>Identify key customer requirements (outputs) from the process map or voice of the customer studies.</p> <p>Assign a priority score to each output according to the importance to the customer.</p> <ul style="list-style-type: none"> • Usually on a 1 to 10 scale, with 10 being most important • If available, review existing customer surveys or the other customer data to make sure your scores reflect customer | F/014 C&E Matrix (Figure 33) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|--------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | | | <p>needs and priorities.</p> <p>Identify all process steps and key inputs from the process map. List down the side of the matrix</p> <p>Rate each input against each output based on the strength of their relationship.</p> <p>Cross-multiply correlation score with priority score and add across for each input</p> <p>Create a Pareto chart and focus I the variables relationships with the highest total scores. Especially focus on those where there are acknowledge performance gaps.</p> | |
| <p>Problem statement TQM Plan template</p> | <p>In the TQM Plan you will see the main problem of the functions at work in the university; these are the areas that will contribute to the overall completion of the service.</p> | <p>Budgets and timeframes are integral elements of project management and are often the key elements used when assessing a project's performance.</p> <p>This process will focus on the quality that is happening company wide.</p> | <p>When will take a great deal of effort, time and work. This will be work from every contributing person in the company. The only way this program can work is with each person working together in consistency</p> | <p>F/005 TQM Plan (Figure 24)</p> |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|---------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Significance Quality Priority Number matrix | <p>To document the priority of a selection process and criteria</p> <p>To make sure the priority quality selected provides the best chance for meeting the project goals.</p> | Whenever you have two or more alternatives or criteria to compare (which will be the priority of the time) | <p>Remove show stoppers from your list of priority</p> <p>Consider organization fit for each remaining idea</p> <p>Determine project goal impact for each remaining idea</p> <p>Narrow the list</p> <p>Enter the criteria and top solution alternatives into a solution matrix</p> <p>Score alternatives on each criterion.</p> <p>Use FMEA or any risk-evaluation technique commonly used in your company, as appropriate.</p> | F/009 Scoring Template (Figure 28) |

4.3.4 Preparation

The purpose of it is, to prepare the final draft of a TQM Plan including the selection of improvement projects, roles and responsibilities.

4.3.4.1 Description

1. Update TQM Plan Charter.
2. Define and develop improvement projects (QIP) associated with each KAQI.
3. Define roles and responsibilities.
4. Document TQM Plan.

4.3.4.2 Key activities

1. Update and validate TQM Plan Charter.
2. Devise a QIP (including QIP charter) for each KAQI.
3. Prepare the final document of the TQM Plan.

4.3.4.3 Deliverables

1. TQM Plan charter updated.
2. Project Charter of each QIP.
3. TQM Plan documented.

4.3.4.4 Tools

1. TQM Plan charter template / update workshop.
2. Project selection (including Project Charter template).
3. TQM Plan template.

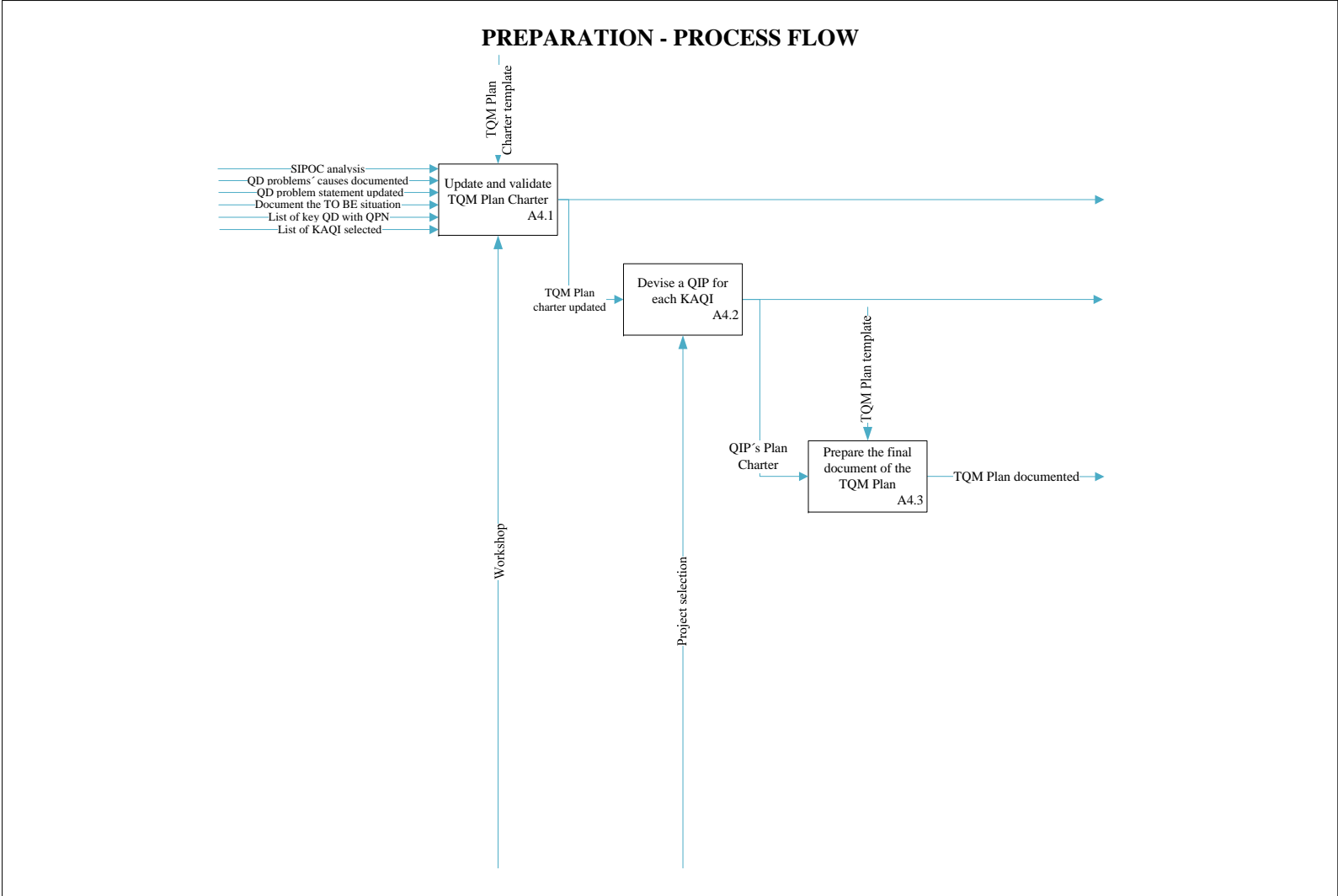


Figure 17: Preparation - Process flow

Table 6: Preparation tools

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| TQM Plan charter template | It is a tool that describes all interactions of the project and sets the stage for a successful completion. Explains ten elements of total quality management implementation. In the TQM Plan you will see the main functions at work in the university; these are the areas that will contribute to the overall completion of the finished products. | Budgets and timeframes are integral elements of project management and are often the key elements used when assessing a project's performance. This process will focus on the quality that is happening company wide. | When will take a great deal of effort, time and work. This will be work from every contributing person in the company. The only way this program can work is with each person working together in consistency. | F/005 TQM Plan (Figure 24) |
| update workshop | Seminar in which the participants work individually and/or in groups to solve actual work related tasks to gain hands-on experience. | To confirm the improved process. | Review range of potential participants, professionals, women's groups, youth groups, traditional leaders, religious leaders, business groups, regional administration and parliamentarians, local NGO consortium, etc. Selection of participants – aligning criteria with elements in Concept Note, conferring with Core Coordinating Group. Preparing participants to be actively involved (pre-workshop briefings, etc.) | F-002 Workshop Meeting Minutes (Figure 21) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | | | Facilitating vibrant discussions (translation, interpretation, structure of breakout groups vs. plenary discussions, etc.) | |
| Project Charter template | <p>In project management, a project charter or project definition is a statement of the scope, objectives and participants in a project. It provides a preliminary delineation of roles and responsibilities, outlines the project objectives, identifies the main stakeholders, and defines the authority of the project manager. It serves as a reference of authority for the future of the project. The terms of reference are usually part of the project charter.</p> | <p>The project charter is usually a short document that refers to more detailed documents such as a new offering request or a request for proposal.</p> <p>To authorize the project - using a comparable format, projects can be ranked and authorized by Return on Investment.</p> <p>Serves as the primary sales document for the project - ranking stakeholders have a 1-2 page summary to distribute, present, and keep handy for fending off other project or operations runs at project resources. As a focus point throughout the project - for example: project as people walk in to team meetings and use in change</p> | <p>The project charter establishes the authority assigned to the project manager, especially in a matrix management. It is considered industry best practice.</p> <p>The purpose of the project charter is to document:</p> <ul style="list-style-type: none"> • Reasons for undertaking the project • Objectives and constraints of the project • Directions concerning the solution • Identities of the main stakeholders | F/011 Project Charter (Figure 30) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| | | control meetings to ensure tight scope management. | | |
| TQM Plan template | <p>It is a tool that describes all interactions of the project and sets the stage for a successful completion. Explains ten elements of total quality management implementation.</p> <p>In the TQM Plan you will see the main functions at work in the university; these are the areas that will contribute to the overall completion of the finished products.</p> | <p>Budgets and timeframes are integral elements of project management and are often the key elements used when assessing a project's performance.</p> <p>This process will focus on the quality that is happening company wide.</p> | <p>When will take a great deal of effort, time and work. This will be work from every contributing person in the company. The only way this program can work is with each person working together in consistency</p> | F/005 TQM Plan (Figure 24) |

4.3.5 Acceptance

The purpose of it is, to communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO.

4.3.5.1 Description

1. Communicate properly the TQM Plan to involve the university community.
2. Obtain authorization from the authorities to advance to TQM Plan implementation and have collective acceptance to ensure success.

4.3.5.2 Key activities

1. Create communication plan, selecting key participants (deans, directors) for feedback.
2. Communicate TQM plan and ask for feedback.
3. Review and update TQM plan with feedback collected including proof of the need statement.
4. Obtain Commitment from Top Management and key actors.
5. Obtain written authorization for TQM Plan implementation.

4.3.5.3 Deliverables

1. TQM Plan Communication Plan.
2. Feedback document.
3. TQM plan updated and final document.
- 4.-TQM Plan authorized.

4.3.5.4 Tools

1. TQM Plan communication template.
2. Stakeholder dialogue.
3. TQM Plan template (updated).
4. TQM Plan workshop program and engagement plan.

Figure 17 shows the Preparation phase process flow.

Figure 18 shows the Acceptance phase process flow using IDEF0.

Figure 19 shows the object model.

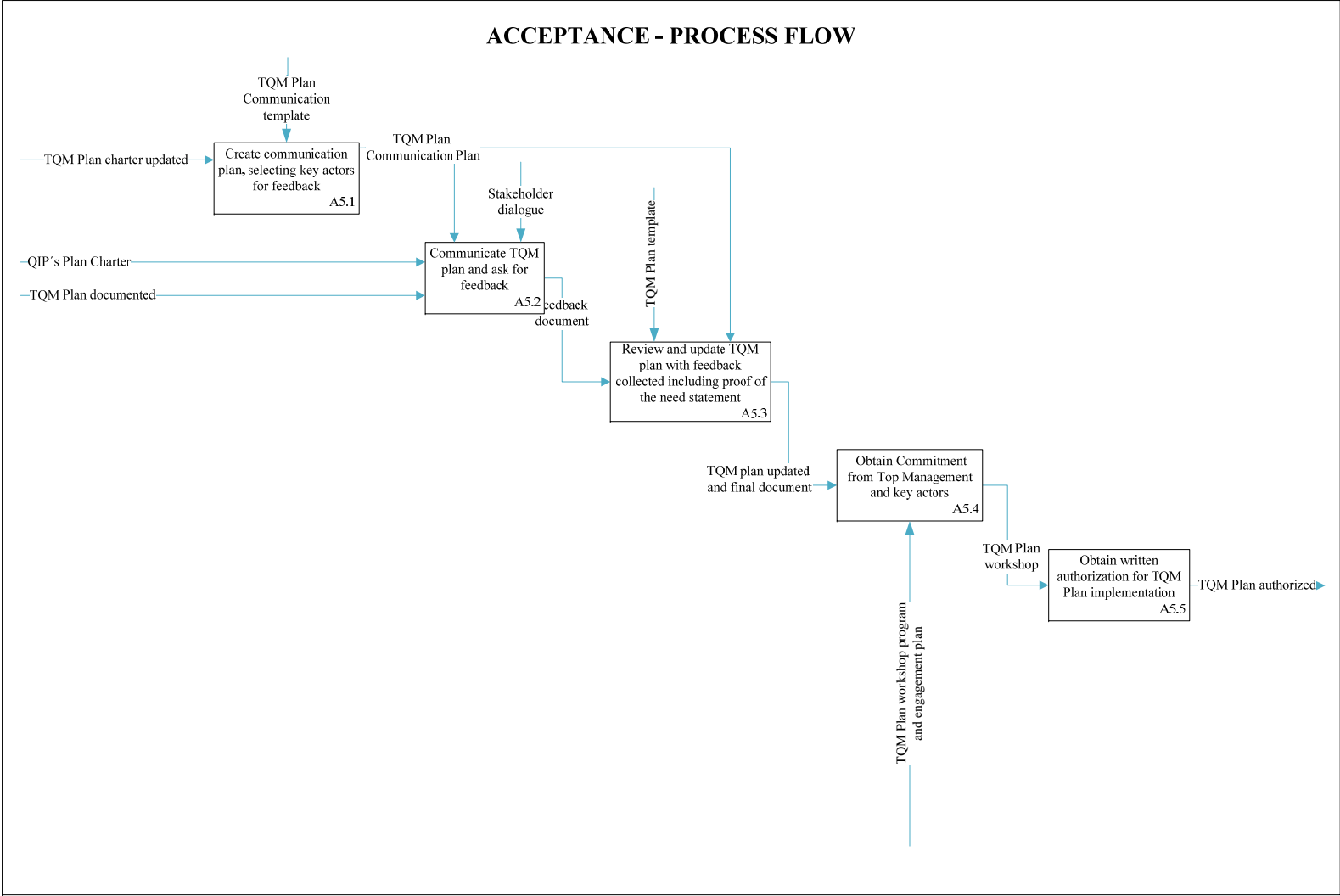


Figure 18: Acceptance

Table 7: Acceptance tools

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| TQM Plan communication template | The purpose of writing a communication plan is to effectively use communications as a tool to help solve a problem or exploit an opportunity. | This provides the reader with a general overview of what the communication plan seeks to accomplish. Tell the reader what the problem or opportunity is and what the impact will be to the organization. Then explain how the plan will help solve the problem or help the opportunity. | <p>You'll want to list all the issues that will be addressed in the plan. Along with each issue, provide facts about the issue or what affect this issue will have on the business.</p> <p>Key Messages: These are the messages that you ultimately want to convey in your communications. Key messages should be simple and clearly written.</p> <p>It's easy to keep track of your plans using a worksheet or table format. Your columns should use the following headings: Date/Timing; Action; Description/Comments; Target Audience; Objectives; and Lead/Responsible. On each line or row, list the steps required to move your plan from start to finish. You'll want to include actions such as conference calls, meetings, memo distribution or whatever needs to take place to bring your plan to completion.</p> | F/012 TQM Plan communication (Figure 31 |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|
| | | | <p>By evaluating your plan you will learn what messages worked with what audience, which activities had the greatest impact and which ones was a waste of time. By measuring your success you will be in a position to develop a stronger, more comprehensive plan when the next issue or opportunity develops.</p> | |
| Stakeholder dialogue | <p>Stakeholder dialogue offers a tool to engage people in serious discussion, and a designed and facilitated process for groups to initiate dialogue with those persons and institutions that have a stake in their activities. Dialogue is about communicating with stakeholders in a way that takes serious account of their views.</p> | <p>It means that stakeholder input should be acknowledged and thoughtfully considered. It is about giving stakeholders a voice, listening to what they have to say, and being prepared to act or react accordingly</p> | <p>Though dialogues are, in effect, simply meetings, it is important to remember that they provide a powerful tool to listen and learn more about stakeholders. They also offer a mechanism to share one's own thinking and to maintain and/or strengthen relationships</p> | F-004 Meeting Minute (Figure 23) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| TQM Plan template (updated). | It is a tool that describes all interactions of the project and sets the stage for a successful completion. Explains ten elements of total quality management implementation. In the TQM Plan you will see the main functions at work in the university; these are the areas that will contribute to the overall completion of the finished products. | Budgets and timeframes are integral elements of project management and are often the key elements used when assessing a project's performance. This process will focus on the quality that is happening company wide. | When will take a great deal of effort, time and work. This will be work from every contributing person in the company. The only way this program can work is with each person working together in consistency | F-005 TQM Plan (Figure 24) |
| TQM Plan workshop program. | It is a schedule of meetings which discusses, evaluates and monitors the TQM Plan | This takes the form of a formal work plan and might simply be an elaboration of the proposals and associated documentation developed to date. | The work plan needs to address: <ul style="list-style-type: none"> • formal timeframe commitments; • budgetary allocation; • participant role descriptions; • output indicators; • evaluation approaches and success measures; and | F-007 Validation Workshops minute (Figure 26) |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|-------|-------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| | | | <ul style="list-style-type: none"> • contingency strategies. <p>In addition, the engagement plan can serve as a formal or informal ‘contract’ with the public. In areas where participation has been poor because of low levels of trust, making this document participative, or public, can be useful to demonstrate commitment to the engagement approach by the agency and provide a benchmark against which agency performance can be observed by stakeholders and potential participants.</p> <p>As the implementation process moves forward, the formal engagement plan can serve as the basis for supporting documentation such as:</p> <ul style="list-style-type: none"> • the marketing and promotion strategy; • the technical specifications and, if necessary, contracting documents for systems | |

| Tools | What is it? | When do you use it? | How do you use it? | Template |
|-----------------|---------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | | | development; <ul style="list-style-type: none"> • evaluation frameworks; • the final report; and the evaluation report. | |
| Engagement plan | The Effective Engagement Planning Tool has been developed to assist practitioners plan their engagement activities. | Each of the planning steps, you will be asked to provide information about your project; including the stakeholders, the activities you will undertake, the risks associated, how you will evaluate the engagement and the learning that will result. | It means forming links between the staff and students of the University and the communities, industries and professions the University serves. It means being a source of knowledge and cultural capital building for those constituencies. Engagement extends across all the University's activities, encompassing teaching, research, services, policies and practices. | F/013 Engagement plan (Figure 32) |

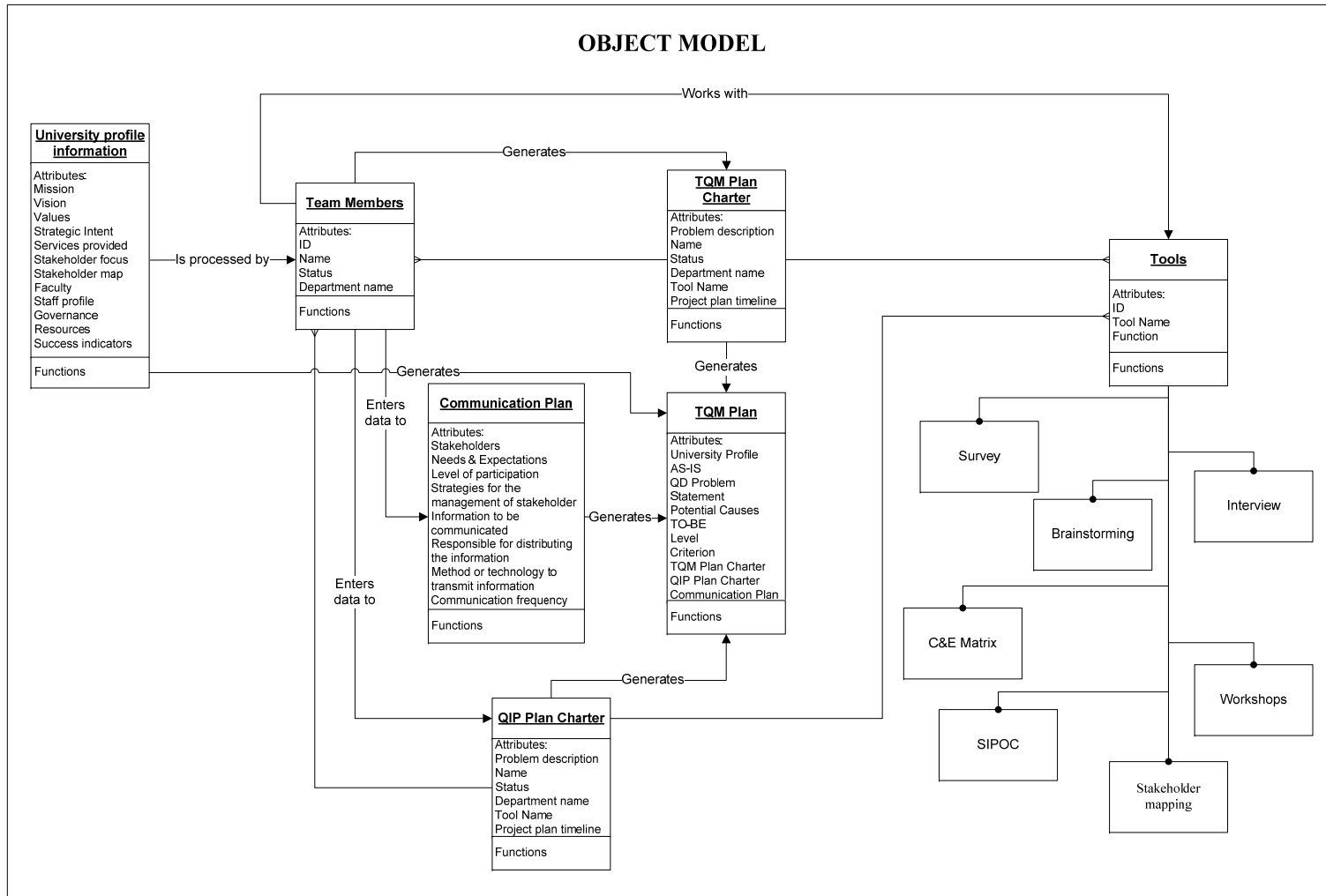


Figure 19: TQM Methodology Object Model

F/001 Verificación List

Date:

Name:

Interview:

University's Area:

| Question | Process | Observation |
|----------|---------|-------------|
| | | |

Figure 20: Verification list

F/002 Workshop Meeting Minutes

Date:

Names:

Area or Section:

| item | Agreements |
|------|------------|
| | |

Figure 21: Workshop meeting minutes

F/003 Stakeholder maps

Date:

Name:

| Stakeholders | Expectations | Position |
|--------------|--------------|----------|
| | | |

Figure 22: Stakeholder maps

F/004 Meeting Minute

Date:

Name:

Unit:

| Problem | Agreement |
|---------|-----------|
| | |

Figure 23: Meeting minutes

F/005 TQM Plan

Date:

- 1. University Profile**
 - 1.1 Mission, Vision and Values**
 - 1.2 TQM plan Charter (incluye education and research Quality definition)**
 - 1.3 SServices provided**
 - 1.4 Stakeholder focus**
 - 1.5 Governance**
 - 1.6 Faculty and staff profile**
 - 1.7 Resources**
 - 1.8 Success indicators**
- 2. Gap Analysis.- Current situation versus the desired state.**
 - 2.1 Quality Dimensions (incluye mapa de procesos por cada dimensión-SIPOC)**
- 3. QIPs charter**
- 4. Communication Plan**

Figure 24: TQM Plan

F/006 Quality Dimentions

Date:

| AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|----------------|----------------------|------------------|-------|-----|---|---|-------|
| | | | | L | I | A | Total |
| GENERAL | | | | | | | |
| | | | | | | | |

Figure 25: Quality dimensions

F/007 Validation Workshops minute

The objective of the checklist is to assist the organizers of the validation workshops as they prepare. The following are key elements to take into account:

Examples of all documents mentioned can be found at www.undgo.org

Considerations for Convening the Validation Workshop

- Review range of potential participants -- professionals, diaspora, women's groups, youth groups, traditional leaders, religious leaders, business groups, regional administration and parliamentarians, local NGO consortium, etc.
- Selection of participants – aligning criteria with elements in Concept Note, conferring with Core Coordinating Group
- Preparing participants to be actively involved (pre-workshop briefings, etc.)
- Facilitating vibrant discussions (translation, interpretation, structure of breakout groups vs. plenary discussions, etc.)

Agenda

The Agenda should include the following:

- Context – brief description of objectives of the PCNA in this country (drawn from Concept Note)
- Background of the meeting – what has been done in the PCNA process to date?
- Reminder of the agreed criteria for prioritization of possible actions/interventions (drawn from Concept Note)
- Objectives of this Validation Workshop
- Organization of the workshop including methodology and structure of sessions
- Expected outcomes

Contact Information List/Participants list

Develop a detailed participants' list that includes complete names and titles, organization, e-mail and telephone, and have it sent out in advance and available in printed form on the day of the Workshop. This will ensure all participants are kept well informed in advance and will allow them to receive any other relevant information afterwards, and it will help them stay in contact with each other. This list should include facilitators and resource persons.

Figure 26: Validation workshop minute

F/008 Chart Flow Process

Process Name:

Date:

| Responsibility | Flow |
|----------------|------|
| | |

Figure 27: Chart flow process

F/009 Scoring Template

Date:

Name:

| | Impact | Alignment | Level |
|--------|--------|-----------|-------|
| Low | | | |
| Medium | | | |
| High | | | |

Figure 28: Scoring template

F/010 SIPOC

SIPOC

Dimension:

Date:

Elaborated by:

| Supplier | Inputs | Process | Outputs | Customer |
|----------|--------|--------------------------------------------------------------------------------------------------------------------------------------|---------|----------|
| | | <div style="border: 1px solid black; width: 100%; height: 20px; margin-bottom: 5px;"></div> <div style="text-align: center;">↓</div> | | |
| | | <div style="border: 1px solid black; width: 100%; height: 20px; margin-bottom: 5px;"></div> <div style="text-align: center;">↓</div> | | |
| | | <div style="border: 1px solid black; width: 100%; height: 20px; margin-bottom: 5px;"></div> <div style="text-align: center;">↓</div> | | |
| | | <div style="border: 1px solid black; width: 100%; height: 20px;"></div> | | |

Figure 29: SIPOC

F/011 Project Charter

| Project Name Review date Authorized by | | | | | | |
|-----------------------------------------------------------------------------------------------------|------------|-------------|------------|-------------------------------------|----------|---------------------|
| Case: Why this Project should be implemented for the benefit of the university and the stakeholders | | | | Problem or improvement opportunity | | |
| | | | | | | |
| Objective | | | | Scope of the process to be improved | | |
| | | | | | | |
| | | | | | | |
| Project Plan | | | | Team | | |
| Step | Start date | Finish date | Actual End | Name | Function | Expected dedication |
| | | | | | | |
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Figure 30: Project Charter

F/012 TQM Plan communication plan

Date:

| | | | |
|-----------------------------------------|--|--|--|
| Stakeholders | | | |
| Contact Information | | | |
| Requirements | | | |
| Information to be communicated | | | |
| Communication strategies | | | |
| Responsible to distribute communication | | | |

Figure 31: TQM Plan communication plan

F/013 Engagement Plan

Date:

| INFORM | CONSULT | INVOLVE | COLLABORATE | EMPOWER |
|--------|---------|---------|-------------|---------|
| | | | | |

Figure 32: Engagement plan

F/014 C&E Matrix

Date:

| | | Criterion A | Criterion B | Process Outputs |
|---------------|----------------|--------------------------------|-------------|-----------------|
| | Importance | Number | Number | |
| Process Steps | Process Inputs | Correlation of input to output | | Total |
| | | | | |
| | | | | |
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| | | | | |
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Figure 33: Cause and effect matrix

5 TQM METHODOLOGY APPLICATION: UNIVERSITY TQM PLAN

First of all describe the university, providing a historical review, its founders, first colleges, the university in figures, and information of interest, to create a baseline. Provide information about the university in the national, regional or global context. Indicate why the university has decided to use IAAPA methodology for improving quality.

Initiation

The purpose of the initiation phase is to collect information about the University and to identify the scope, goals and stakeholders.

The activities that need to be done are the following:

1. Collecting and reviewing the vision, mission, values of the university by interviews and workshops to the university government. Also, in this activity the university government shall to define the strategic intent by workshops:

Table 8: Initiation

| Mission | Vision | Values | Strategic intent |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ABC is an academic community inspired by ethical and catholic principles promoting culture, values and knowledge, promoting change, dedicated to the integral formation of humans and citizens. | To lead University level education in the country and to be recognized nationally and internationally as a generator of development. | Values form the basis of their organizational culture and essential elements that forged the identity of our University provide uniqueness and claim their social presence. They are: Search for the truth Respect for the dignity of the person Pluralism Social responsibility and commitment to human development Honesty Solidarity Justice | The ABC University is pursuing to be the first university in the region that provides high quality education and research recognized at international level. |

2. Collecting information about the problem description of the university related to quality, identifying the team members, tools and the project plan with its timeline. For this activity, the TQM Plan charter should be used. In this charter, the quality definition in education and research has to be determined by using brainstorming.

Table 9: TQM Plan Charter

| <p>Problem Description Perception that there is not an appropriate level of high quality educational and research services to satisfy all the university stakeholders. Perception of urgent need of establishing a challenging vision of the University, including quality measurement objectives for the next 10 years. Perception of need to redesign the current processes. Quality definition for education and research in the university is to satisfy all the stakeholders' requirements.</p> | <p>Team Members TQM Project Manager: Vicepresident Team: Finance Director Administration Director Academic Affairs Director Academic Vice Provost Research Vice Provost</p> | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------|-------------------|------------------------|-------------------|----------------------|-----------------|-----------------------|--------------------|-----------------------|-------------------|---------------------------|
| <p>Tools TQM plan template / TQM plan charter Survey/workshop/interview Stakeholder mapping/Brainstorming QD template and validation workshop Priority Analysis TQM plan communication strategies</p> | <p>Project plan/Timeline Start Date: January 15th</p> <table border="0"> <thead> <tr> <th></th> <th>Due Date</th> </tr> </thead> <tbody> <tr> <td>Initiation</td> <td>March 15th</td> </tr> <tr> <td>Assessment</td> <td>May 15th</td> </tr> <tr> <td>Analysis</td> <td>June 15th</td> </tr> <tr> <td>Preparation</td> <td>July 15th</td> </tr> <tr> <td>Acceptance</td> <td>September 1st</td> </tr> </tbody> </table> | | Due Date | Initiation | March 15 th | Assessment | May 15 th | Analysis | June 15 th | Preparation | July 15 th | Acceptance | September 1 st |
| | Due Date | | | | | | | | | | | | |
| Initiation | March 15 th | | | | | | | | | | | | |
| Assessment | May 15 th | | | | | | | | | | | | |
| Analysis | June 15 th | | | | | | | | | | | | |
| Preparation | July 15 th | | | | | | | | | | | | |
| Acceptance | September 1 st | | | | | | | | | | | | |

3. Collecting information about the services that the university provides. The tool used for this activity is the interview to the Administrative Vice - provost and Research Vice-provost.

Table 10: Educational Programs

Undergraduate

| | |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Administration and Accountancy College |
| 2 | Sciences and Engineering College Physics Chemistry Mathematics Civil Engineering Mining Engineering Mechanical Engineering Mechatronics Engineering Industrial Engineering Systems Engineering Electronics Engineering Telecommunications Engineering |
| 3 | Law College Law |
| 4 | Management and Direction College Management and Direction Graduate |
| 1 | Master programs in Industrial Engineering |
| 2 | International MBA |
| 3 | Master programs in Constitutional Law |
| 4 | Doctorate in Law |
| 5 | Doctorate in Business Administration |

Table 11: Research Centers and field of research

| | | |
|---|----------------------------------|--------------------------------------------------------------------------------------------------|
| 1 | Sciences and Engineering College | Areas of physics, chemistry and mathematics. Areas of technology and sustainable development. |
| 2 | Law College | Area of social sciences. |
| 3 | Management and Direction College | Quality, organizational management and environment management area. |

4. Collecting information about educational and research stakeholders and identifying their interests and power level by mapping them, and using the stakeholders mapping tool.

- How do you determine the target students and stakeholders of both educational and research services?

Currently, there is no way to determine the target students and stakeholders of both educational and research services. In the case of students 82% of them come from Lima, and, generally, from private high schools. There is no study about identifying the stakeholders and their needs and expectations for educational services, they are served when they contact the university either personally, by web or internet based platforms, by telephone or when the university organizes visits to Campus or projects with High schools.

The same case is for the stakeholders of research services. Each professor selects some investigation areas to develop and looks for organizations that would provide funds, but there is not an institutional plan that guides with a vision and a policy about this activity. Thus, there is not an organized way to contact the stakeholder of research services, and there is a different way in each Department.

- Who are your main stakeholders?

Table 12: Stakeholders Map

| | | Main stakeholders | |
|---|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| | College | Education services (undergraduate and graduate) | Research |
| 1 | Administration and Accountancy College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers | Students Professors Society Science community Companies |
| 2 | Sciences and Engineering College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers | Students Professors Society Scientist community Companies Industrial Sector |
| 3 | Law College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers The State | Students Professors Society Scientist community Companies The State |
| 4 | Management and Direction College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers Industrial sector | Students Professors Society Scientist community Companies Industrial sector |

Table 13: Undergraduate Students

| | College | Total |
|---|----------------------------------------|--------------|
| 1 | Administration and Accountancy College | 240 |
| 2 | Sciences and Engineering College | 2,894 |
| 3 | Law College | 1,733 |
| 4 | Management and Direction College | 612 |

Table 14: Graduate Students

| | College | Part-Time | Full-Time | Total |
|---|-----------------------------------------|------------------|------------------|--------------|
| 1 | University Graduate School - Masters | 364 | 1458 | 1,822 |
| 2 | University Graduate School - Doctorates | 16 | 66 | 82 |

Table 15: Annual Research Expenditure (in US\$)

| | College | Total |
|---|----------------------------------|------------------|
| 1 | Sciences and Engineering College | US \$ 29,518,586 |
| 2 | Law College | US \$ 17,497,733 |
| 3 | Management and Direction College | US \$ 2,983,681 |

Table 16: Desired profile

| | | Desired profile of: | | |
|---|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| | College | Prospective undergraduate students | Prospective graduate student | Prospective funding institution for research |
| 1 | Administration and Accountancy College | <ul style="list-style-type: none"> • Solid training in basic sciences: mathematics and social sciences. • Numerical ability, verbal reasoning and comprehension, mechanical and abstract reasoning. • Ability to analyze, summarize and relationship with the team. | <ul style="list-style-type: none"> • Bachelor's degree in business administration, accounting related careers. • Skills and experience in managing teams. • Skill to design solutions to complex problems. • Skill in analytical methods. • Visionary leadership. | Multilateral agencies for funds that allow applied research and development as social Agreement with State Institutions, Foreign Universities, |

| | | | | |
|---|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Ease of expression, sociability, broad vision of the world and perspective on possible developments. • Bias analysis, understanding and reflection of the economic, social, political and administrative environment. • Proactive organizational capacity and leadership. • You must have ease of accounting, business administration, problem analysis, and diagnosis and solutions proposition. | | International Programs |
| 2 | Sciences and Engineering College | <ul style="list-style-type: none"> • Knowledge of physical, chemical and mathematical sciences. • Knowledge in computational tools. • Skills to perform and interpret technical drawing • Skills to solve new situations. • Ability to develop criteria for problem solving through analysis and synthesis • Spirit of observation to investigate how and why the phenomena • Ability to coordinate and properly express their ideas. • High common sense to distinguish concepts and engineering approaches. • Ability to integrate in an interdisciplinary way. | <ul style="list-style-type: none"> • Bachelor's degree in science or engineering or related careers. • Skill and experience in solution of problems, designs products and interdisciplinary integration. • Scientific and technical knowledge in basic disciplines. • Sensitivity to detect problems that can be resolved and interest to contribute to solutions. • Ability to manage databases, programs of simulation, processing text and access to consultation via internet. • Available to carry out research inter and multi-disciplinary. • Inclination for actions to promote the training of human resources, training and transformation and technology innovation. • Professional ethics in the development of scientific research and educational activities. | <p>Agencies multilateral funds to applied research in quality and social entrepreneurship</p> <p>Agreement with State institutions, foreign universities, international programs.</p> |

| | | | | |
|---|----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 3 | Law College | <ul style="list-style-type: none"> • Calling for Justice. • Altruistic spirit of perseverance. • Discipline for reading. • Oral and written expression ability to communicate with his environment • Investigative and restless spirit because of the events of the legal, economic and socio-political environment. • Student with abstract and logical reasoning skills. • Tolerant and critical spirit • Honesty and civic-mindedness | <ul style="list-style-type: none"> • Bachelor's degree in Law. • Student tracked with the object of study of the law to make its best effort and put at the service of their professional qualification process. • Aware of the law responds to become an instrument of social control, involving professional exercise a strong ethical framework, scientific rigor and high sense of responsibility. • Possess interpretive, argumentative and propositional skills. • Willing to commit their specialization studies jointly with the other activities that deal with their personal and professional life. | International institutes of legal research in the areas of Administrative Law, Environmental Law, Information Law, Constitutional Law, Social Law, International Law, Tax Law, Litigation Law And Criminal Law |
| 4 | Management and Direction College | <ul style="list-style-type: none"> • Solid training in basic sciences and social sciences • Ability to express ideas clearly and correction • Ability to integrate concepts from different disciplines • Willingness to work in team and flexibility • Creativity, innovation and rigor • Capacity for analysis and synthesis • Fluency, sociability. | <ul style="list-style-type: none"> • Bachelor's degree in engineering, management or other related programs. • Managers of enterprises, financial managers, accountants, economists, and other professionals who are playing administrative, executive and managerial functions or aspire to assume them. • Entrepreneurs wishing to update their knowledge. • Entrepreneurs wishing to set up and launch their own business | Agencies multilateral funds to applied research in quality and social development Agreement with State institutions, foreign universities, international programs |

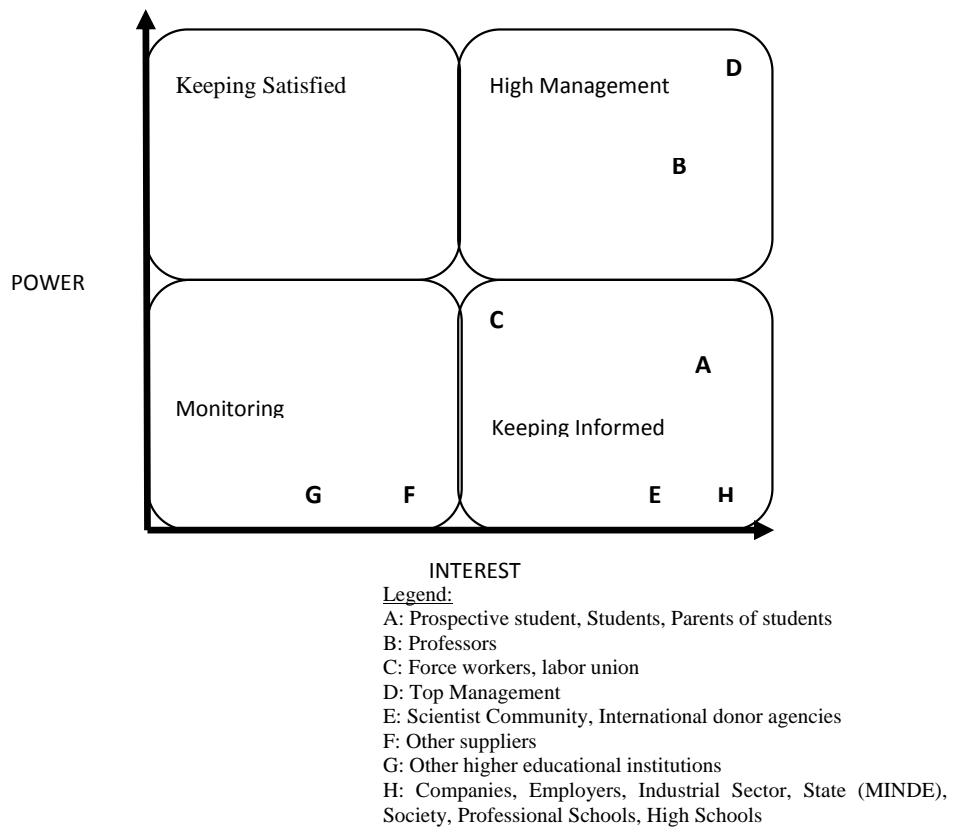


Figure 34: Matrix Power / Interest

5. Collecting information about the governance board, central administration by interviewing the governance board.

The organization Chart is shown in Figure 35 and includes:

The administration of the ABC University is by the next authorities and governing board:

University Assembly

The University Assembly is the top governing body of the University and its main functions are the following:

- Modify the University’s statute and oversee its compliance;

- Elect the Academic Vice – Provost, Research vice-provost and Administrative Vice - Provost;
- Elect, at the Academic Vice - Provost ´s suggestion, the Academic Directors;
- Ratify the Development Plan and the University Operational Plan approved by the University Council;
- Elect the members of the University Electoral Committee
- Making a statement on the Provost´ s Annual Review and assessing the operations of the University;
- Agree to the creation, merger, suppression or restructuring of academic units, its programs or Programs.

The University Assembly includes the following members:

- Provost, Research Vice Provost , Administrative Vice Provost and Academic Provost;
- Deans;
- Tenured faculty members´ representatives;
- Student representatives;
- Peruvian Episcopal Conference representatives (5), designated by the Episcopal Conference.

University Council

The University Council is the superior body of promotion and execution of the University and its main functions are the following:

- Approve, at the President´ s request, the University´ s Development and Operation Plans, and submit them to ratification by the University Assembly;

- Approve the Election Regulations, and general and special regulations;
- Propose the creation, merger, suppression or restructuring of academic units or its programs;
- Agree and ratify study and work plans proposed by the different academic units;
- Name, hire, promote, confirm, remove and ratify faculty members and administrative personnel, at the request, in this case, of the respective academic units;
- Award the academic degrees and professional titles approved by the Colleges, as well as awarding honorific distinctions and recognize and revalidate studies, degrees and titles of foreign universities;
- Approve admission and incorporation modalities, and the number of places for each admission contest;
- Approve the University's annual budget;
- Adopt the measures attaining to the University's economy, accept legacies and donations, and authorize actions and contracts;
- Exert disciplinary power over the faculty members, students and administrative personnel, in the way and degree determined by the regulations;

The University Council is comprised of:

- Provost , Research Vice Provost , Administrative Vice Provost and Academic Provost;
- Current Deans
- Academic Directors
- Student representatives

Colleges

The Colleges are the fundamental organization, and academic and professional formation units. They are integrated by faculty members, work force (administrative) and students. In these colleges one or more disciplines or programs are studied through a defined curricular structure

Each college is in charge of a College Board and a Dean. For its better operation, a college may have an Assistant Dean for Academic Programs.

The faculty members that integrate the College Board are elected by the ordinary faculty members for a period of three years and can be re-elected.

The University includes the following College:

- Administration and Accountancy
- Sciences and Engineering
- Law
- Management and Direction

Graduate College

Postgraduate studies are followed in the Graduate College. Postgraduate studies lead to Master and Doctoral Degrees. The Graduate College has academic, administrative and governmental autonomy.

The Graduate College is run by a Council which is chaired by a Dean and integrated by six ordinary faculty members part of its Faculty Board. The Dean of the Graduate

College must possess the academic degree of Doctor (or its foreign equivalent) and should be a Full Professor of the University for not less than three years and at least ten in teaching functions. The Dean is elected by the College Board for a period of three years and has the same attributions and rights as the Deans of the College.

The ABC University complements its academic offer with 14 centers and institutes specialized in the study of different disciplines, such as architecture and urban planning, international affairs, social sciences, culture, education, enterprises and university, geography and environment, humanities, languages, informatics, engineering and democratic institutions. The specialized centers and institutes are the following:

- ABC Cultural Center
- Dispute Analysis and Resolution Center
- Innovation and Development Center
- Applied Geography Research Center
- Music and Dance Center
- Business Center
- Pre – University Center
- Institute for Human Rights and Democracy
- Environmental Studies Institute
- Institute for Quality

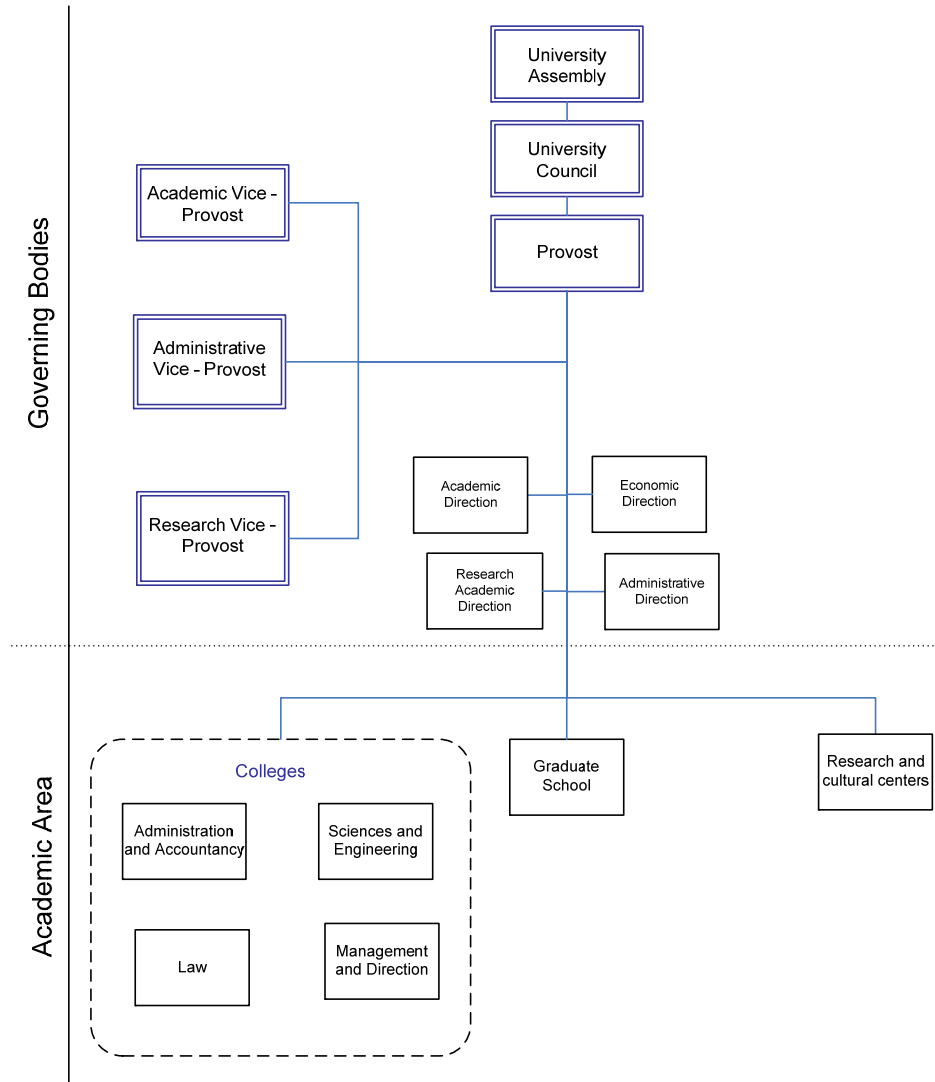


Figure 35: Organization Chart-ABC University

- How does your governance system support the quality levels which your university has?

ABC University is well recognized for the quality of its programs in his country and is proud that the majority of its graduates find employment immediately after graduation. The provost and the Research and Academic Vice Provost are looking for improvement

the programs quality and implement some strategies such as the ISO 9001 Quality System Management certificated for each colleges.

The professional internship program and the emphasis on design and team work are important strengths of the engineering programs. Classrooms, offices and laboratories are generally modern and well maintained. The morale of the professors, staff and students is excellent and there is clearly a good collegial attitude across all programs.

6. Collecting information about faculty and staff profile by interviewing to Academic Direction Director.

- Faculty by time status

The University has 257 full-time Professors and 846 part time Professors, of which 4% correspond to the College of Administration and Accounting, 53% to College of Science and Engineering, 32% to the College of Law and 11% at the College of Management.

- Non-Faculty staff: Central administration, colleges, other.

31% of the staff belongs to the Central Administration, 29 % to the College of Science and Engineering, 20% to the College of Law, College of Management 11% and 9 %.

- How do you evaluate and manage your staff and faculty competencies to support the University mission and overall quality?

For the different personal, including the faculty, there are descriptions of their function but it doesn't include their competencies. However there are two mechanisms to evaluate

the professors: The course survey at the final of each course and the general satisfactory survey that are applied once a year to all of students. For the rest of the staff there is an annual evaluation of their performance that is done by the Administration Direction.

7. Collecting information about resources by interviewing the Administrative Vice-Provost and Dean of each program.

- Library and learning resources

The ABC University has a Central Library and a Specialized Library in each College. The students have access to them for investigation and take information about the field of their specialization. Additionally, the university library provides online access to 25 specialized databases, some of these specialized in Sciences and Engineering, such as:

- CSA Science and Technology Research
- Chemical abstracts
- American Chemical Society Archives
- PROLA (Physical Review on-line Archives)
- ACM Portal (Association for Computing Machinery)
- ASTM standards
- American Concrete Institute standards
- American Welding Society standards
- World Telecommunications Indicators (ITU)

The purchases of bibliographic material are made on the basis of faculty member's requests about subjects related to their programs. Furthermore, the library provides the service of document delivery that complements the material available in its collections. This service is required by students and faculty members for the development of thesis papers and/or research.

The services provided by these libraries are:

- Integrated online catalogue;
- Library or home loan;
- Purchase of publications;
- Document delivery;
- Inter – library loan with libraries from other institutions such as: British Library, Canada Institute for Scientific and Technical Information, Spanish Superior Council for Scientific Research, the Ibero-American Science and Technology Education Consortium, amongst others;

- Access to online databases, some of them with remote access;
- Training of library resources for users;
- Bibliographic search;
- Monthly bibliographic alters;
- Magazine content tables;
- Wi – Fi Internet connection.
- Financial resources, tuition, non-tuition

ABC University has an annual budget of \$530 million; 60% of it is belongs to tuition and only the 40% is of other sources such as external community services, research financial, funding and others.

- Physical resources

ABC University has a Central Admission Office, Central Library, Administration and Accountability College (in two buildings), the Science and Engineering College (in three buildings), the Law College (in two buildings), the Management and Direction College, Pre-university Center, the Central Administration, the ABC Theater, Central Auditorium, Sports area, Graduates Association. The classrooms have the necessary equipments and materials for the classes and the laboratory facilities are adequate to practices of experiments or projects that need to do the students.

- How do your resources support the quality levels which your university has?

The ABC University is continued concerned about the services quality level and look for that the students have all the necessary facilities that permit to reach the programs objectives and the investigator can do their researches. However there is some action to do to be better.

8. Collecting information about success indicators by interviewing to professors, Program Coordinator and Dean.

Table 17: Success indicators

| | Education services | Research |
|---|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| 1 | Number of freshmen | N° de publications/college/annual |
| 2 | Compliance with quality indicators: Instructor performance Level of satisfaction with facilities and administrative services offered | External investment in research |
| 3 | Number of graduates | Number of doctoral graduates |
| 4 | Student publications in indexed journals. | |

I. Assessment

This phase has the purpose to identify and evaluate each quality dimension in base of its state of the art.

The activities that need to do are the following:

1. Defining the Quality dimensions that apply at the university and identifying their problem statements if it is applicable. Workshops should be done in order to do this activity.

Table 18: Assessment

| | AS-IS | QD Problem statement |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| GENERAL | | |
| Stakeholder focus | <p>ABC University is recognized as one of the best universities in the country. This is recognition of the quality of its teaching, research, publications, social responsibility, and cultural contribution.</p> <p>Few interest groups are participating directly or indirectly in teaching, research and administration.</p> | Current interest groups are involved in the university, however working isolated from others develop, failing to form cross functional and multidisciplinary teams. |
| Governance and administration | <p>The Government and administration of the University is conformed of a number of powers which are responsible for addressing the University to achieve its vision and mission.</p> <p>Its function is to ensure a suitable administrative, educational and research management involving to meet their objectives.</p> <p>These powers are as follows:</p> <p>The Council University; which is the supreme organ of the promotion and implementation of the University</p> <p>Provost; who legally represents the university chairs its governing bodies, runs academic life, administrative management and promotes the research of the institution.</p> <p>Administrative academic and research Vice Provost are responsible for collaborating with the Provost on tasks</p> | The main problem with the ABC University is the degree of flexibility or stiffness of the structures of their powers to deal with changes in the environment; also the uniformity or diversity of choices within a university system. |

| | AS-IS | QD Problem statement |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | with the Assembly and University Council. Academic directors, which are made up of elected schools Professors. | |
| Strategic Planning | University strategic planning takes place based on the strategic institutional Plan. This Plan shows processes, strategic objectives and institutional goals aimed at improving the performance of the ABC University in the areas of research, training and social responsibility with the participation of the entire University community Members of our community among Professors, students, graduates, staff and authorities are involved in the development of the strategic planning. | The main problem observed in strategic planning is that while the University advanced significantly improves the quality of what is delivered to the members of the University community and society, this development was stronger and more visible within the processes of management and administrative support than the academic activity or social responsibility level. |
| Leadership | The ABC University leadership is exercised on the basis of achieved prestigious factors objective and qualitative as the quality of Professors, the prestige of graduates, the quality of academic publications, technological developments, cultural events and all activities carried out by the University as an expression mission alive and giving it a reputation and legitimacy among their peers and to society in general. The ABC University has been able to employ its recognition and institutional leadership for creative purposes, promotion of academic and scientific development and as a source of an authoritative opinion on the problems of the country. | The problem presented in the leadership, is perceived by some Professors who adopt an authoritarian style to certain situations that face University (relations with the stakeholder). |
| Financial | The ABC University is a non-profit institution. The economic resources come from income, legacy and donations from natural or legal persons, and the public contribution provided by the State. As well as the borrowing requirement for investment in research and development projects. The payment for academic rights will be according to the tiered pension system, economic potential individual or family, or by other arrangements the University Council may establish. Also the ABC University maintains grants and loans to certain students. The draft annual budget of the University shall be prepared by the Area of | The realization of financial operations for the calculation of risk scenarios for the financing and investment, are made operatively using spreadsheets. This creates difficulty and delay in obtaining clear and accurate information for decision-making. |

| | AS-IS | QD Problem statement |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Economy, having consideration of the Operation Plan, income and academic units and services and of the Central Administration proposals | |
| Process management | <p>ABC University is aware that the success of management depends, increasingly, that its processes are aligned with their strategic vision, mission and objectives. Therefore, the university has units that are under a certified or accredited Quality Management.</p> <p>These units with QMS (certified or accredited ones) seek to identify customer requirements and achieve their satisfaction and / or ensure that the methodologies used to obtain the results are reliable.</p> | The main problem is that the units with a QMS certified or accredited have been developed without considering the traceability of the processes that apply to the entire organization. This causes that the QMS units are managed as "islands" and are not contributed to the objectives of the university. |
| Faculty | <p>ABC University has a part-time and full-time faculty at both undergraduate and graduate studies. The majority of professors do some research.</p> <p>To be a faculty member, professor candidates must meet the following requirements:</p> <ul style="list-style-type: none"> • Having the academic degree of Doctor, Master's or professional degree • Winning the university contest organized by the Academic Department to cover the respective vacancy. <p>Also, there is a mechanism for evaluation and promotion of Professors. This mechanism considers 3 criteria: Category, professional degree and Performance Evaluation.</p> | <p>Learning styles of full-time and part-time professors vary by time teaching experience and professional degree. It has a significant impact on teaching and learning achieved.</p> <p>It also notes that the ratio teacher / student ratio is low.</p> |
| Workforce focus | <p>ABC University has tenure and non tenure staff (part-time and full time) to perform the designated activities for each college.</p> <p>The administrative staff is made up of: workers, secretaries, assistants, analysts, coordinators, supervisors, consultants, managers and directors.</p> <p>Administrative staff works in different units of the university and bring support to faculty and the others research projects.</p> | <p>The active participation of the union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.</p> <p>For example: To schedule training, the labor union requested that these be made between the hours of work, but for the University this means having to pay extra man-hours in order to do daily activities.</p> |
| EDUCATION | | |
| Students focus | <p><u>Admission:</u> There are 4 admission modalities to the university; they target different prospect students, depending on age and/or</p> | <p>The grades attributed to students are generally low and failure rates are high.</p> <p>Although there is an office that brings</p> |

| AS-IS | QD Problem statement |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------|
| <p>personal aptitudes: Talent Examination, Examination for Honor Students, High School Honor Program and Direct Admission via Pre-University Center.</p> <p>Students are examined in Math, Physics and writing skills in order to assure a standard level due to differences in High Schools. Depending on his/her test scores, students shall take Introductory Studies courses or start his/her first semester as a regular freshman.</p> <p>Graduates Students are examined in Math and Writing, besides of interviews, in order to be admitted at the university.</p> <p>The tuition fees charged to students already admitted are a function of their financial status.</p> <p><u>Evaluating Student Performance:</u> The evaluation system is absolute; the grades are numeric values between "0" and "20." Students will graduate if they successfully pass all the required and elective courses with a grade greater or equal to 11. Furthermore, they are required to pass a test on proficiency in English (reading).</p> <p>The students who flunk a required course must take it again. If the course is an elective one, the students may or may not take it again; in the latter case, they must take another elective.</p> <p>Via university intranet, students may complete all steps for course registration. At intranet, students are presented with all the courses they can take; they are chosen based on the course requirements.</p> <p>Furthermore, intranet allows the Program Coordinator and some faculty members to access the academic record of a particular student since he/she was admitted in the university, i.e.: course load per semester, grades and the number of times he/she has registered for a particular course.</p> <p><u>Advising Students:</u></p> | <p>advising, there are few students that ask for it.</p> |

| | AS-IS | QD Problem statement |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| | <p>The Office of Orientation, Information and Student Support is a department of the university and their staff is a multidisciplinary group of professionals from the academic areas of Sciences, Engineering and Humanities and the area of Social Support (PUCP's social services) who work to give advice, information and permanent support to students.</p> <p>The main goals of this department are: To gather knowledge about the needs, difficulties and interests of students, aiming to improve the academic environment and to assist the student with vocational orientation.</p> <p>To create channels to increase the participation, motivation, integration and compromise of the student with the University.</p> <p>Seek information to elaborate a diagnosis for the academic and vocational status of the university students in order to develop new policies based on facts.</p> | |
| Curriculum | <p>The Program Curriculum involves the preparation of students for engineering professional practice. In order to achieve this, the course contents cover an adequate group of subject areas.</p> <p>The Area Coordinators are in charge of compliance from the faculty members in their respective areas in regards with the Curriculum and course content. The Area Coordinators are helped by the Course Coordinators, who notify them if there are any irregularities in the fulfillment of the Curriculum or if they want to make any change to it or to the contents of a particular course.</p> <p>The Area Coordinators provide information about these changes to the FT faculty members. Any change in the Curriculum is discussed and pre approved by these group of Professors and by the Program Coordinator.</p> <p>However, the Area Coordinators are not</p> | <p>The programs curriculum of the university do not has an international recognition.</p> |

| | AS-IS | QD Problem statement |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>the only ones that propose changes. These can be proposed by any faculty member or by the Dean.</p> <p>The Program Coordinator must attend every semester to meetings scheduled with the Assistant Dean for Academic Programs, communicating him/her the proposed changes to the Curriculum. The Assistant Dean for Academic Programs must in turn present these changes to the Dean.</p> <p>The Dean must submit any changes to the Curriculum to the School Board for its respective approval.</p> | |
| Learning facilities | <p><u>Classrooms</u></p> <p>The classrooms used for the program are located in multi – purpose buildings throughout the university campus. The number of classrooms in the first two is seventy (70). These classrooms are shared by all the programs according to a varying class demand every semester. The capacity of each classroom is variable.</p> <p>Every classroom has a personal computer, with Windows XP operating system, Internet access (this includes access to PUCP's intranet). The computers are loaded with the software required for the specific class. All classrooms are equipped with a multimedia projection system and a blackboard and have the Tables and chairs required by the assigned capacity.</p> <p><u>Laboratory Facilities</u></p> <p>The program has a number of laboratories that allow the practice of experiments and the development of projects related to the courses offered in the study plan. All the laboratories have equipment, measurement instruments and software tools that fulfill the program's requirements.</p> <p>The planning for new acquisitions and the scheduling of maintenance takes place</p> | <p>The amount of students has increased in the last five years and the capacity of classrooms, laboratories and libraries is very limited and is dispersed in several buildings.</p> |

| | AS-IS | QD Problem statement |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>every year, these activities are performed by the Section Coordinator, with the support of his/her Assistant and Secretary. These activities happen as a result of a request from the Professors involved in the laboratory courses.</p> <p>The process of selection evaluation and proposal of software tools for the laboratories is an activity that the Section Coordinator has delegated to a FTF teacher. The budget for acquisitions, operation and maintenance is covered by the University.</p> <p><u>Library</u> The students have access to several libraries. The characteristics of each one depend on the field of specialization.</p> <p>The libraries are open to the students from 8:00 a.m. to 10:00 p.m. from Monday to Friday, and from 8:00 a.m. to 6:00 p.m. on Saturdays. Moreover, there is an online catalogue of books that allows to search and reserve copies.</p> <p>Additionally, the university library provides online access (via intranet) to 25 databases.</p> | |
| International students | <p>It is applicable to students from foreign universities who wish to extend their knowledge to register on regular or special courses offered by the University. This registration is for a maximum of two semesters and does not lead to a degree or title.</p> <p>All courses are offered in Spanish, so students must have good Spanish skills.</p> | International students do not have the opportunity of obtaining a degree or title as a result of their studies at the university. |
| International faculty | International Faculty members are known professionals in their field and bring a unique expertise to the Faculty. | There are not policy and standard procedure of teaching with foreign faculty at the university. |
| RESEARCH | | |
| Total research expenditures | The ABC University considers research as generating knowledge activity and an essential dimension of University activity, carried out by Professors and students grouped in various colleges, centers and institutes, according to the characteristics | While it has the support to research in the various colleges and university centers, observing that the promotion is more oriented to further promote the development of research project implementation and dissemination of |

| | AS-IS | QD Problem statement |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | <p>of each of the instances. The Vice President for Research is in charge of incentives, finance, coordinate and disseminate the research efforts at our University is The lines of research defined in the ABC University are: Individual research topics: they are those that each teacher provides freely and permit to identify its priority areas of interest and dedication. They are weighted on the broader comprehensive evaluation of the teaching that is carried out by the Coordinator of the Section and the Head of Department.</p> <p>Sector research topics: they are those established in sections or departments from the confluence of researchers on a line to the strengthen and project. They are defined with the endorsement of the Coordinator of the Section and the Head of the Department; evaluated continuously by these bodies and regularly, in its "consistency", by academic research management.</p> <p>Matrix research lines: they are those which are proposals from the synergy between sector research topics, as well as the needs of the environment and the broader institutional development prospects. They are defined by the Academic Research Management, permanently evaluated by this instance and regularly by an "ad hoc" Committee appointed by the Rector.</p> <p>Annually the ABC University makes expenditures investigation of approximately \$ 50 million. Colleges that perform more research expenses are those of Science and Engineering and Law.</p> | <p>results.</p> |
| <p>Doctoral degrees awarded</p> | <p>The ABC University has more than 100 doctor's graduates of its graduate school. Their offered doctoral degrees are in the following specializations: Doctorate in Law Doctorate in Physics Doctorate in Mathematics</p> | <p>Most graduates of the doctoral students usually performed only a research to obtain the PhD degree. After, participation in research is little, and they are more focused in administrative activities and pedagogical education.</p> |

| | AS-IS | QD Problem statement |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | All these doctorates have duration of 2 years and are dictated in an inter-daily frequency and in the evenings. The schedule was appropriate based on requests from students. | |
| Papers indexed | The ABC University has conducted various scientific and technological publications from various sources such as the Science Citation Index (SCI) and the Social Science Citation Index (SSCI), which are administered by the Institute for Scientific Information (ISI) who publishes Journal Citations Report. | Some publications in research carried out in the current year are not yet indexed. Time to run this process tends to take in some cases more than one year. |
| Citations per Faculty member | Research work of scientific and technological nature carried out by the ABC University is identified as important for his contribution to the development of society issues. Many of the publications in journals have been taken by other educational institutions and research centers, as a reference for the development of other research. | In the ABC University there is the problem to cite Professors in publications. In many cases the way of writing the name and surname with abbreviations, varies according to criterion of the researcher. Standardization is needed. |
| Faculty awards | The ABC University annually organize a contest in which rewards the best projects and research work carried out by the different Colleges and units that make up. Also the various Colleges contest at the national and international level to present their research work. | There are still several researches that are not submitted to national and international contests. This is due to low diffusion performed on these contests at the domestic level. |

2. Mapping each Quality dimensions using SIPOC tool.

Dimension: Stakeholder focus
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------------|---------------------------|----------------------------------------------|----------------------------------------------|---------------------------------|
| Office of the Provost | University strategic plan | Stakeholder Identification | Stakeholder identified | Provost and Viceprovost offices |
| Stakeholder | Interview meetings act | Identify the interests of Stakeholders | Identified interests | Provost and Viceprovost offices |
| Stakeholder focus | Workshop | Make an array of cross-stakeholder interests | Matrix of interrelationships of Stakeholders | Provost and Viceprovost offices |
| Stakeholder focus | Report of the workshops | Action plans preparation | Action plans | Provost and Viceprovost offices |
| Stakeholder focus | Action plans | Action plans implementation | Action plans schedule | Provost and Viceprovost offices |

Figure 36: SIPOC - Stakeholder focus

Dimension: Governance and Administration
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|----------------------------------------|-------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| University Board and University Senate | Strategic plan of the University and the reports issued by the Vice President | Faculty Human Resources Management | Goals, procedures, rules and budgets | Students and Professors |
| University Board and University Senate | Report on the results of the previous year and the strategic plan of the University management. | Office of the Vice Provost Management | Objectives and goals, policies, procedures, rules, programs and budget. | Students, Professors and administrative staff |
| University Board and University Senate | Report on the results of the previous year and the strategic plan of the University management. | Office of the Provost Management | Objectives and policies, procedures, rules, programs and budget. | Students, Professors and administrative staff academic directors and Vice Provost |
| University Board and University Senate | Report on the results of the previous year and the strategic plan of the University management. | University Council Management | Objectives and policies, strategies | Students, Professors, administrative staff, academic directors, Vice Provost and Rector. |
| University Senate | Report on the results of the previous year and the strategic plan of the University management. | University Board Management | Objectives and policies, strategies | Students, Professors, administrative staff, academic directors, Vice Provost, Rector. |

Figure 37: SIPOC - Governance and Administration

Dimension: Strategic Planning
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| University governance | Report of the study of the current situation of the University and market studies. | Identification of needs and requirements of the Stakeholder | Report Requirements | Stakeholders |
| University governance and Stakeholders | Report of the study of the current status of the University of studies of market and report requirements. | SWOT Matrix | SWOT Matrix Prepared | Stakeholders |
| Governance | SWOT Matrix Prepared | Elaboration of the strategic intent, vision, mission and objectives | Strategic intent, vision, mission and objectives developed and elaborated SWOT matrix. | University governance and Stakeholders |
| University governance and Stakeholders | Strategic intent, vision, mission and objectives developed and elaborated SWOT matrix. | The Strategic Plan | Strategic plan | University governance |
| University governance | Strategic plan, programmed budget | Implementation of the Strategic Plan | Report on implementation of the Strategic Plan, budget executed | University Government, students, Professors and administrative staff. |
| University governance, students, Professors and administrative staff. | Report on implementation of the Strategic Plan, budget executed | Monitoring of the Strategic Plan | Follow-up report on the executed budget and strategic plan. | University Government, students, Professors and administrative staff. |

Figure 38: SIPOC - Strategic Planning

Dimension:

Date: February 18th

Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------|------------------------------|-------------------------|
| Professors and students | National and international scientific and technological information | Identification of topics of interest to the scientific, technological and social research. | Topics selected for research | Professors and students |
| Professors and students | Topics selected for research | Generation of publications on the topics of interest investigated. | Publications produced | Stakeholders |
| Professors and students | Publications produced | Generating opinions | Published opinions | Stakeholders |

Figure 39: SIPOC - Leadership

Date: Financial
 February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------------------|--------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------|-----------------------|
| Administrative Vice Provost | Partial financial results by each business unit | Income funds | Report of financial results | University governance |
| Administrative Vice Provost | Report of financial results, rates of interest and profitability of financial institutions | Financial results analysis | Financial performance analysis report | University governance |
| Administrative Vice Provost | Financial performance analysis report | Investment decision-making | Strategic investment plan | University governance |
| Administrative Vice Provost | Strategic investment plan | Indebtedness decision-making | Report of results of financial operations | University governance |

Figure 40: SIPOC - Financial

Dimension: Process Management
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|---------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|
| University governance | Identification of the need for Standardization processes | Implementation and maintenance of quality management systems in the units of the University | Implemented quality management system | University administrative units |
| University administrative units | Identified records for data collection | Analyses of data from the quality management systems | Report of the data analysis meeting | University governance |
| University administrative units | Management Review Report | Management Review | Management Review act | University governance |
| University administrative units | Management Review Report | Decision-making and follow-up to the management review agreements | Management Review and follow-up agreements table | University governance |

Figure 41: SIPOC - Process Management

Dimension: Faculty
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-------------------------|-------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|----------------------|
| Colleges | Identifying needs | Call | Publication of the call | Society |
| Faculty Human Resources | Curriculum vitae of the applicants, the selected profile, review of selection | Selection | Result of selected Professors | Teacher candidates |
| Faculty Human Resources | Result of selected Professors | Recruitment | Report with hired Professors | Colleges |
| Faculty Human Resources | Induction presentation | Induction | Induction act | Hired Professors |
| Faculty Human Resources | Training schedule | Training | Training act | Trained Professors |
| Faculty Human Resources | Evaluation criteria | Performance Evaluation | Results of the evaluations and identification of needs | Competent Professors |

Figure 42: SIPOC - Process Management

Dimension: Workforce focus
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|--------------------------------|-------------------------------------------------------------------------------|------------------------|--------------------------------------------------------|--------------------------------|
| Units of the University | Identifying needs | Call | Publication of the call | Society |
| University administrative unit | Curriculum vitae of the applicants, the selected profile, review of selection | Selection | Result of selected candidates | Applicants |
| University administrative unit | Result of selected candidates | Recruitment | Report with hired applicants | University administrative unit |
| University administrative unit | Induction presentation | Induction | Induction record | Hired staff |
| University administrative unit | Training schedule | Training | Training record | Trained staff |
| University administrative unit | Evaluation criteria | Performance Evaluation | Results of the evaluations and identification of needs | Competent staff |

Figure 43: SIPOC - Workforce focus

Dimension: Students focus
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------|--------------------------------|---------------------------------------------|--------------------------------------|-----------------------|
| Schools | High School Students | Admission | Freshmen | Students Parents |
| Professors | Courses content | Learning | Knowledge | Students |
| Professors | Evaluations Advising System | Evaluating student performance and advising | Approval courses Advised Students | Students Parents |
| Colleges | Undergraduates | Promotion | Bachelor | Students Employees |

Figure 44: SIPOC - Students focus

Dimension: Program Educational Objectives
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------------|-------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------|----------------------------------|
| Provost Professors | Vision Mission Professors ideas | Reviewing vision and mission and making brainstorming | Vision and Mission reviewed Meeting minutes | Professors |
| Professors | Professors ideas | Elaborating undergraduate / graduate profile preliminary | Meeting minutes | Academic Affairs Direction |
| Academic Direction | Undergraduate / graduate profile preliminary | Reviewing and approving possible undergraduates / graduates profile | Undergraduate / Graduate profile | Students Parents Employees |

Figure 45: SIPOC - Program Educational Objectives

Dimension: Curriculum
Date: February 19th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------|
| Professors | PUCP legal standards National legal standards applied to universities Review similar curriculum programs Comparative analysis with other universities List of possible courses | Elaborating curriculum | Curriculum preliminary | Program Coordinator |
| Program Coordinator | Curriculum preliminary | Reviewing and approving curriculum | Curriculum reviewed by the Program Coordinator | Dean |
| Dean | Curriculum reviewed by the Program Coordinator | Reviewing and approving curriculum | Curriculum reviewed by the Dean | College Board |
| College Board | Curriculum reviewed by the Dean | Reviewing and approving curriculum | Curriculum reviewed by the College Board | Academic Vice-Provost Director of Academic Direction |
| Academic Vice-Provost Director of Academic Direction | Curriculum reviewed by the College Board | Reviewing and approving curriculum by the Academic Vice-Provost and the Director of Academic Direction | Curriculum reviewed by the Academic Vice-Provost and the Director of Academic Affairs | University Council |
| University Council | Curriculum reviewed by the Academic Vice-Provost and the Director of Academic Direction | Approving curriculum | Curriculum approved | Students Parents Employees |

Figure 46: SIPOC - Curriculum

Dimension: Learning facilities
Date: February 19th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|----------|-----------------------------------------------------------|-------------------------------|-----------------------------------------|------------------------|
| Colleges | Requirements: books, software, capacity, equipments, etc. | Assigning learning facilities | Classrooms Laboratories Libraries | Students Professors |

Figure 47: SIPOC - Learning facilities

Dimension: International Students
Date: February 19th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|------------|----------------------|--------------------------------|------------------|-----------------------------------|
| Schools | High School Students | Admission | Freshmen | International Students Parents |
| Professors | Courses content | Learning | Knowledge | International Students |
| Professors | Evaluations | Evaluating student performance | Approval courses | International Students |

Figure 48: SIPOC - International Students

Dimension: International Faculty
Date: February 19th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|--------------------|-------------------------------|----------------------------------|------------------------------------|--------------------|
| College | Professors candidates resume | Selection | International Professor candidates | Academic Direction |
| Academic Direction | Professors candidates resume | Hiring | International Professor hired | College |
| Academic Direction | Performance evaluation survey | Evaluating professor performance | Performance evaluation | College |

Figure 49: SIPOC - International Faculty

Dimension: Total Research Expenditures
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|------------------------------------------------------|---------------------------------------|------------------------------------------------------|-------------------------------------------------------|--------------------------------------|
| Research Units | Identifying needs | Identification of the subjects according to research | Research topics | Professors and students |
| Research and the University economy management units | Research topics | Generation and adoption of research budgets | Approved budgets | Research Units |
| Economic Management University | Approved budgets | Execution and control of research budgets | Update income and expenditure reports | Research Units |
| Economic Management University | Update income and expenditure reports | Results of research expenditure | Annual budget execution report | Research Units |
| Economic Management University | Annual budget execution report | Evaluation of new investment in research | Report of the research results and impacts to society | Research Units, Faculty and Students |

Figure 50: SIPOC - Total Research Expenditures

Dimension: Doctoral Degree Awards
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|------------------------------------|-----------------------------------------------|------------------------------------------------------------|---------------------------|------------------------------------------------|
| Prospective students | Entrance exam | Acceptance / Admission | Results entrants | Prospective students |
| Professors | Contents of courses | Learning and assessment of student performance | Knowledge | PhD students |
| PhD students | Research progress reports | Development and research support | Thesis Research | Professors |
| PhD academic unit | Suitable for graduation students relationship | Graduation of the students and awards of the best research | Certificates awarded | Professors and students |
| PhD academic unit | Suitable for publishing research work | Manage the publication of research | Published research papers | Professors and students |
| Dissemination of research agencies | Published research papers | Awards received | Awards | University Government, Professors and students |

Figure 51: SIPOC - Doctoral Degree Awards

Dimension: Paper Indexed
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------|---------------------------------------------|------------------------------------------------------------------------|----------------------------------|-------------------------|
| Professors | Information on the research work to develop | Development of research work | Research work | Professors and students |
| Professors | Research works | Publication of research papers in the PUCP libraries and written media | Publishing papers in the library | Stakeholder |
| Professors | Publishing papers in the library | Manage the publication of research on indexed pages work | Indexed publications | Stakeholder |

Figure 52: SIPOC - Paper Indexed

Dimension: Citations per faculty member
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-------------------------|---------------------------------------|------------------------------|-----------------|----------------------------------|
| Professors and students | Research papers published and indexed | Citations per faculty member | Citations found | Professors, students and society |

Figure 53: SIPOC - Citations per faculty member

Dimension: Faculty Awards
Date: February 18th
Elaborated by: Jose Carlos Flores Molina

| Supplier | Inputs | Process | Outputs | Customer |
|-----------------------|----------------------------------------------|----------------------------------------------------------|-----------------------------|-----------------------------------------|
| University Government | Strategic plan of research | Promoting research | Widespread research works | Research units, Professors and students |
| Research Units | Widespread research works | Promotion and dissemination of the research competitions | Advertising of competitions | Research units, Professors and students |
| Research Institutions | Registration forms and disseminated research | Dissemination of the obtained Awards | Awards | Research units, Professors and students |

Figure 54: SIPOC - Faculty Awards

Figures 36 through 54 shows SIPOC for each quality dimension.

II. Analysis

The purpose of the analysis phase is to study and verify the causes of the current quality levels and select the significant areas for improvement.

The activities that need to be done are the following:

1. Analyzing the QD mapping by using brainstorming and SIPOC analysis, analyzing the potential causes for each problem statement by using the C&E matrix and selecting the main causes. If it is applicable, the problem statement would be updated.
2. With the problem statement updated and the main causes selected, the “To Be” situation of each QD has to be built.
3. Qualifying each QD with the following criteria:

Level: Qualify the current quality level of the QD “As-Is”

- +
Scale $\xrightarrow{5 \quad 3 \quad 1}$

Impact: Impact of the QD to quality

- +
Scale $\xrightarrow{1 \quad 3 \quad 5}$

Alignment: Alignment of the QD with the Strategic Intent

- +
Scale $\xrightarrow{1 \quad 3 \quad 5}$

The significance QPN matrix has to be used in order to assign a QPN for each QD. The output of this activity is the KAQI, which are the QD with a QPN assigned.

Table 19: Analysis

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| GENERAL | | | | | | | | |
| Stakeholder focus | <p>ABC University is recognized as one of the best universities in the country. This is recognition of the quality of its teaching, research, publications, social responsibility, cultural and contribution to academic and institutional leadership.</p> <p>In the administrative, academic and university research processes there are groups participating directly or indirectly.</p> | <p>Current interest groups involved in the university, are working in isolated and their development goals for college fail to be cross-functional with other stakeholders.</p> | <p>Bureaucracy in university management.</p> | <p>The stakeholders identified should be involved in the development of the strategic plan.</p> | 3 | 3 | 5 | 45 |
| Governance and administration | <p>The Government and administration of the University is conformed of a number of powers which are responsible for addressing the University to achieve its vision and mission. Its function is to ensure a suitable administrative, educational and research management processes to meet their objectives.</p> <p>These powers are as follows: The Council University; which is the supreme body of the promotion and implementation of the University</p> | <p>The main problem with the ABC University is the degree of flexibility or stiffness of the structures of their powers to deal with changes in the environment; also the uniformity or diversity of choices within a university system.</p> | <p>The Government of the University does not have adequate management plans that can cope with possible demands of its staff to organizational change.</p> | <p>The powers of Government and administration of the University must develop transversal action plans involving a prior analysis of the environment and the impacts that might have on their staff. The powers of the University must maintain the same structure but make their</p> | 5 | 3 | 3 | 45 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>Provost; who legally represents the university chairs its governing bodies, runs academic life, administrative management and promotes the research of the institution.</p> <p>Administrative academic and research Vice Provost are responsible for collaborating with the Provost on tasks with the Assembly and University Council.</p> <p>Academic directors, which are made up of elected schools Professors.</p> | | | processes more flexible and capable of responding effectively to the changing environment. | | | | |
| Strategic Planning | <p>University strategic planning takes place based on the strategic institutional Plan. This Plan shows processes, strategic objectives and institutional goals aimed at improving the performance of the ABC University in the areas of research, training and social responsibility with the participation of the entire University community</p> <p>Members of our community among Professors, students, graduates, staff and authorities are involved in the development of the strategic planning.</p> | <p>The main problem observed in strategic planning is that while the University advanced significantly improves the quality of what is delivered to the members of the University community and society, this development was stronger and more visible within the processes of management and administrative support than the academic activity or social responsibility level.</p> | <p>University more emphasized to the administrative management in order to provide better service to meet the needs of its customers.</p> | <p>The University Strategic Plan should focus on three important fronts: management and administrative support, academic activity and Social responsibility, and promotion of the scientific and technological research.</p> | 5 | 3 | 5 | 75 |
| Leadership | <p>The ABC University leadership is exercised on the basis of achieved prestigious factors</p> | <p>The problem presented in the leadership, is perceived by some</p> | <p>Ignorance of the strategic plan, not having clear goals and</p> | <p>ABC University leadership should focus on a</p> | 3 | 3 | 5 | 45 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>objective and qualitative as the quality of Professors, the prestige of graduates, the quality of academic publications, technological developments, cultural events and all activities carried out by the University as an expression mission alive and giving it a reputation and legitimacy among their peers and to society in general.</p> <p>The ABC University has been able to employ its recognition and institutional leadership for creative purposes, promotion of academic and scientific development and as a source of authoritative opinion on the problems of the country.</p> | <p>Professors who adopt an authoritarian style to certain situations that face University (relations with the stakeholder).</p> | <p>objectives and not have transversal processes generate authoritarian leadership models in some units of the University.</p> | <p>combination of two types of leadership styles: Transformational leadership: involves transforming subordinates challenging them to rise above their needs and immediate interests. Transactional leadership: Involves using techniques how the motivate subordinates working under rewards or punishments.</p> | | | | |
| Financial | <p>The ABC University is a non-profit institution. The economic resources come from income, legacy and donations from natural or legal persons, and the public contribution provided by the State. As well as the borrowing requirement for investment in research and development projects.</p> <p>The payment for academic rights will be according to the tiered pension system,</p> | <p>The realization of financial operations for the calculation of risk scenarios for the financing and investment, are made operatively using spreadsheets.</p> <p>This creates difficulty and delay in obtaining clear and accurate information for decision-making.</p> | <p>The University does not have an automated system to perform financial calculations faster.</p> | <p>The ABC University must have an automated accounting and financial and ERP to speed up its administrative processes.</p> | 3 | 1 | 5 | 15 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>economic potential individual or family, or by other arrangements the University Council may establish.</p> <p>Also the ABC University maintains grants and loans to certain students. The draft annual budget of the University shall be prepared by the Area of Economy, having consideration of the Operation Plan, income and academic units and services and of the Central Administration proposals.</p> | | | | | | | |
| Process management | <p>ABC University is aware that the success of management depends, increasingly, that its processes are aligned with their strategic vision, mission and objectives.</p> <p>Therefore, the university has units that are under a certified or accredited Quality Management.</p> <p>These units with QMS (certified or accredited ones) seek to identify customer requirements and achieve their satisfaction and / or ensure that the methodologies used to obtain the results are reliable.</p> | <p>The main problem is that the units with a QMS certified or accredited have been developed without considering the traceability of the processes that apply to the entire organization. This causes that the QMS units are managed as "islands" and are not contributed to the objectives of the university.</p> | <p>The implementation of the QMS of the units of the University was at various times and at the request of the headquarters or units of each of them. Same consultants were not always involved in the implementation process and criteria used were different for each type of system.</p> | <p>The QMS of the units of the University must be transversal processes interact with other units and will be the basis for the implementation of other automated as ERP systems.</p> | 3 | 3 | 3 | 27 |
| Faculty | <p>ABC University has a part-time and full-time faculty at both undergraduate and graduate studies. The majority of</p> | <p>Learning styles of full-time and part-time professors vary by time teaching experience and</p> | <p>The University has no an appropriate program of training for Professors, no matter</p> | <p>The University should promote research into all Professors.</p> | 5 | 3 | 3 | 45 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>professors do some research.</p> <p>To be a faculty member, professor candidates must meet the following requirements:</p> <ul style="list-style-type: none"> • Having the academic degree of Doctor, Master's or professional degree • Winning the university contest organized by the Academic Department to cover the respective vacancy. <p>Also, there is a mechanism for evaluation and promotion of Professors.</p> <p>This mechanism considers 3 criteria: Category, professional degree and Performance Evaluation.</p> | <p>professional degree. It has a significant impact on teaching and learning achieved.</p> <p>It also notes that the ratio teacher / student ratio is low.</p> | <p>their teaching time. Processes to carry out the programs have no clear criteria to identify training needs by type of Professors.</p> | <p>Consider as a criterion for evaluation of teacher research and publications made by them.</p> | | | | |
| Workforce focus | <p>ABC University has tenure and non tenure staff (part-time and full time) to perform the designated activities for each college.</p> <p>The administrative staff is made up of: workers, secretaries, assistants, analysts, coordinators, supervisors, consultants, managers and directors.</p> <p>Administrative staff works in different units of the university and bring support to faculty and the others research projects.</p> | <p>The active participation of labor union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.</p> <p>For example: To schedule training, the labor union requested that these be made between the hours of work, but for the University this means</p> | <p>The labor force, as part of the Union of the University, is people that prioritize their personal interests on the interests of the University. This hinders the development and improvement of processes.</p> | <p>The University seeks mechanism for sensitization and awareness of all employees in achieving compliance with organizational goals and objectives.</p> | 5 | 3 | 5 | 75 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | | having to pay extra man-hours in order to do daily activities. | | | | | | |
| Other success quality indicators | N.A | N.A | N.A | N.A | | | | |
| EDUCATION | | | | | | | | |
| Students focus | <p>Admission: There are 4 admission modalities to the university; they target different prospect students, depending on age and/or personal aptitudes: Talent Examination, Examination for Honor Students, High School Honor Program and Direct Admission via Pre-University Center.</p> <p>Students are examined in Math, Physics and writing skills in order to assure a standard level due to differences in High Schools. Depending on his/her test scores, students shall take Introductory Studies courses or start his/her first semester as a regular freshman.</p> <p>Graduates Students are examined in Math and Writing, besides of interviews, in order to be admitted at the university.</p> | <p>The grades attributed to students are generally low and failure rates are high.</p> <p>Although there is an office that brings advising, there are few students that ask for it.</p> | <p>The marking scheme used is much harsher than other that used in most other countries This is not only demoralizing for the students but also puts PUCP graduates at a disadvantage when they are evaluated for graduate studies or jobs in other countries</p> <p>The attention time of professors for advising doesn't fit for students. There aren't enough professors to attend all students.</p> | <p>The marking standards in the program should be reconsidered and standardization with other universities.</p> <p>Assigning some students to each professor, whose attention time isn't rigid. Students can make meetings with their advisor taking into account their own studying schedule. Nowadays, advisors are just full time</p> | 3 | 3 | 3 | 27 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>The tuition fees charged to admit students are a function of their financial status.</p> <p><u>Evaluating Student Performance:</u> The evaluation system is absolute; the grades are numeric values between "0" and "20." Students will graduate if they successfully pass all the required and elective courses with a grade greater of equal to 11. Furthermore, they are required to pass a test on proficiency in English (reading).</p> <p>The students who flunk a required course must take it again. If the course is an elective one, the students may or may not take it again; in the latter case, they must take another elective.</p> <p>Via university intranet, students may complete all steps for course registration. At intranet, students are presented with all the courses they can take; they are chosen based on the course requirements.</p> <p>Furthermore, intranet allows the</p> | | | <p>professors. PT professors can help with some advising in order to attend more students.</p> | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>Program Coordinator and some faculty members to access the academic record of a particular student since he/she was admitted in the university, i.e.: course load per semester, grades and the number of time he/she has registered for a particular course.</p> <p><u>Advising Students:</u> The Office of Orientation, Information and Student Support is a department of the university and their staff is a multidisciplinary group of professionals from the academic areas of Sciences, Engineering and Humanities and the area of Social Support (PUCP's social services) who work to give advice, information and permanent support to students.</p> <p>The main goals of this department are: To gather knowledge about the needs, difficulties and interests of students, aiming to improve the academic environment and to assist the student with vocational orientation.</p> <p>To create channels to increase the participation, motivation,</p> | | | | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>integration and compromise of the student with the University.</p> <p>Seek information to elaborate a diagnosis for the academic and vocational status of the university students in order to develop new policies based on facts.</p> | | | | | | | |
| Program educational objectives and student outcomes | The university has a general profile for undergraduates and graduates of the university. | The university ABC doesn't have program educational objectives for each career. | The university didn't have the necessity of establishing and measuring educational objectives because there wasn't direct competition in education. Nowadays, there are many universities with several programs options and the market has become more demanding. Also, the amount of students that go to other countries to studies or works has been increasing. | | 5 | 5 | 5 | 125 |
| Curriculum | The Program Curriculum involves the preparation of students for engineering professional practice. In order to achieve this, the course contents cover an adequate group of | The programs curriculum of the university do not has an international recognition. | The university didn't have the necessity of establishing and measuring educational objectives because there wasn't direct | Establishing program educational objectives for each program, both undergraduates and | 5 | 5 | 5 | 125 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>subject areas.</p> <p>The Area Coordinators are in charge of compliance from the faculty members in their respective areas in regards with the Curriculum and course content. The Area Coordinators are helped by the Course Coordinators, who notify them if there are any irregularities in the fulfillment of the Curriculum or if they want to make any change to it or to the contents of a particular course.</p> <p>The Area Coordinators provide information about these changes to the FT faculty members. Any change in the Curriculum is discussed and pre approved by these group of Professors and by the Program Coordinator.</p> <p>However, the Area Coordinators are not the only ones that propose changes. These can be proposed by any faculty member or by the Dean.</p> <p>The Program Coordinator must attend every semester to meetings scheduled with the Assistant Dean for Academic Programs, communicating</p> | | <p>competition in education. Nowadays, there are many universities with several programs options and the market has become more demanding. Also, the amount of students that go to other countries to studies or works has been increasing.</p> | <p>graduates programs. Measuring program educational objectives with periodicity in order to know what is the achieving of the professional profile. Working to obtain the accreditation (international recognition) of the programs curriculum.</p> | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>him/her the proposed changes to the Curriculum. The Assistant Dean for Academic Programs must in turn present these changes to the Dean.</p> <p>The Dean must submit any changes to the Curriculum to the School Board for its respective approval.</p> | | | | | | | |
| Learning facilities | <p><u>Classrooms</u></p> <p>The classrooms used for the program are located in multi – purpose buildings throughout the university campus. The number of classrooms in the first two is seventy (70). These classrooms are shared by all the programs according to a varying class demand every semester. The capacity of each classroom is variable.</p> <p>Every classroom has a personal computer, with Windows XP operating system, Internet access (this includes access to PUCP's intranet). The computers are loaded with the software required for the specific class. All classrooms are equipped with a multimedia projection system and a</p> | <p>The amount of students has increased in the last five years and the capacity of classrooms, laboratories and libraries is very limited and is dispersed in several buildings.</p> | <p>In the last five years, the number of students has increased and the university's response to this increase has been slow.</p> | <p>Building new laboratories, libraries and classrooms in order to satisfy current and future student's capacity.</p> | 3 | 3 | 3 | 27 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>blackboard and have the Tables and chairs required by the assigned capacity.</p> <p><u>Laboratory Facilities</u> The program has a number of laboratories that allow the practice of experiments and the development of projects related to the courses offered in the study plan. All the laboratories have equipment, measurement instruments and software tools that fulfill the program's requirements.</p> <p>The planning for new acquisitions and the scheduling of maintenance takes place every year, these activities are performed by the Section Coordinator, with the support of his/her Assistant and Secretary. These activities happen as a result of a request from the Professors involved in the laboratory courses.</p> <p>The process of selection evaluation and proposal of software tools for the laboratories is an activity that the Section Coordinator has delegated to a FTF teacher. The budget for acquisitions,</p> | | | | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>operation and maintenance is covered by the University.</p> <p><u>Library</u> The students have access to several libraries. The characteristics of each one depend on the field of specialization.</p> <p>The libraries are open to the students from 8:00 a.m. to 10:00 p.m. from Monday to Friday, and from 8:00 a.m. to 6:00 p.m. on Saturdays. Moreover, there is an online catalogue of books that allows to search and reserve copies.</p> <p>Additionally, the university library provides online access (via intranet) to 25 databases.</p> | | | | | | | |
| International students | <p>It is applicable to students from foreign universities who wish to extend their knowledge to register on regular or special courses offered by the University. This registration is for a maximum of two semesters and does not lead to a degree or title.</p> <p>All courses are offered in Spanish, so students must have good Spanish skills.</p> | <p>International students do not have the opportunity of obtaining a degree or title as a result of their studies at the university.</p> | <p>The programs curriculum of the university do not has an international recognition.</p> | <p>Working to obtain the accreditation (international recognition) of the programs curriculum in order to recognize courses.</p> | 3 | 3 | 3 | 27 |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| International faculty | International Faculty members are known professionals in their field and bring a unique expertise to the Faculty. | There are not policy and standard procedure of teaching with foreign faculty at the university. | At first, the university didn't have the need of having procedures and policy because the quantity of international faculty was low. Nowadays, this number has increased and each college has its own way to work. | Establishing policy and procedures in order to have a standard way of selection, hiring and teaching. | 3 | 3 | 3 | 27 |
| Other success quality indicators | N.A | N.A | N.A | N.A | | | | |
| RESEARCH | | | | | | | | |
| Total research expenditures | The ABC University considers research as generating knowledge activity and an essential dimension of University activity, carried out by Professors and students grouped in various colleges, centers and institutes, according to the characteristics of each of the instances. The Vice President for Research is in charge of incentives, finance, coordinate and disseminate the research efforts at our University is The lines of research defined in the ABC University are: Individual research lines: they | While it has the support to research in the various colleges and university centers, observing that the promotion is more oriented to further promote the development of research project implementation and dissemination of results. | | | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>are those that each teacher provides freely and permit to identify its priority areas of interest and dedication. They are weighted on the broader comprehensive evaluation of the teaching that is carried out by the Coordinator of the Section and the Head of Department.</p> <p>Sector research topics: they are those established in sections or departments from the confluence of researchers on a line to the strengthen and project. They are defined with the endorsement of the Coordinator of the Section and the Head of the Department; evaluated continuously by these bodies and regularly, in its "consistency", by academic research management.</p> <p>Matrix research lines: they are those which are proposals from the synergy between sector research topics, as well as the needs of the environment and the broader institutional development prospects. They are defined by the Academic Research Management, permanently evaluated by this instance and regularly by an "ad</p> | | | | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>hoc" Committee appointed by the Rector.</p> <p>Annually the ABC University makes expenditures investigation of approximately \$ 50 million.</p> <p>Colleges that perform more research expenses are those of Science and Engineering and Law.</p> | | | | | | | |
| Doctoral degrees awarded | <p>The ABC University has more than 100 doctor's graduates of its graduate school. Their offered doctoral degrees are in the following specializations:</p> <p>Doctorate in Law Doctorate in Physics Doctorate in Mathematics</p> <p>All these doctorates have duration of 2 years and are dictated in an inter-daily frequency and in the evenings. The schedule was appropriate based on requests from students.</p> | <p>Most graduates of the doctoral students usually performed only a research to obtain the PhD degree. After, participation in research is little, and they are more focused in administrative activities and pedagogical education.</p> | | | | | | |
| Papers indexed | <p>The ABC University has conducted various scientific and technological publications from various sources such as the Science Citation Index (SCI) and the Social Science Citation Index (SSCI), which are administered by the Institute for Scientific Information (ISI) who</p> | <p>Some publications in research carried out in the current year are not yet indexed. Time to run this process tends to take in some cases more than one year.</p> | | | | | | |

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | publishes Journal Citations Report. | | | | | | | |
| Citations per Faculty member | Research work of scientific and technological nature carried out by the ABC University is identified as important for his contribution to the development of society issues. Many of the publications in journals have been taken by other educational institutions and research centers, as a reference for the development of other research. | In the ABC University there is the problem to cite Professors in publications. In many cases the way of writing the name and surname with abbreviations, varies according to criterion of the researcher. Standardization is needed. | | | | | | |
| Faculty awards | The ABC University annually organize a contest in which rewards the best projects and research work carried out by the different Colleges and units that make up. Also the various Colleges contest at the national and international level to present their research work. | There are still many of researches that are not submitted to national and international contests. This is due to low diffusion performed on these contests at the domestic level. | | | | | | |
| Other success quality indicators | N.A | N.A | N.A | N.A | | | | |

III. Preparation

The purpose of the Preparation phase is to prepare the final draft of TQM Plan including selection of improvement projects, roles and responsibilities.

The activities that need to be done are the following:

1. Define the quality improvement projects (QIP) by establishing the criteria selection. Each university can define its own criteria, for ABC University the QIP should be all the KAQI's that have a QPN greater or equal to 75. The QIP for ABC University are the following:

- Strategic Planning (QPN=75)
- Workforce focus (QPN=75)
- Curriculum (QPN=125)
- Faculty Awards (QPN=75)
-

2. Defining improvements actions for each QIP. These actions have to be described in the QIP Plan Charter; which includes the problem statement, team members, tools and project plan with its time line in base of the PDCA cycle.

Table 20: QIP - Strategic Planning

| <p>QD Problem statement The active participation of the union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.</p> <p>For example: To schedule training, the union requested that these be made during working hours, but for the University this means having to pay extra hours in order to do daily activities.</p> | <p>Team Members QIP Manager: Associate Vicepresident Working team: Vice Provost Offices Academic and Administrative Directors</p> | | | | | | | | | | | | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|--------------------------------|-----------|------------------------------|----------------------------------|--------------|----------------------------------------------------------------------------------|-------------------------------|------------|--------------------------------------------------------------------------------------------------|------------------------------|
| <p>Tools Survey Workshop Interview</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th style="text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td>Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right;">August 15th, 2011</td> </tr> <tr> <td>Do</td> <td>Implementing the activities.</td> <td style="text-align: right;">December 15th, 2011</td> </tr> <tr> <td>Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right;">March 15th, 2012</td> </tr> <tr> <td>Act</td> <td>Determination of root cause. Determining where to apply changes that will result in improvement.</td> <td style="text-align: right;">July 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | Do | Implementing the activities. | December 15 th , 2011 | Check | Measuring the activities and comparing the results against the expected results. | March 15 th , 2012 | Act | Determination of root cause. Determining where to apply changes that will result in improvement. | July 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | December 15 th , 2011 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | March 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Determination of root cause. Determining where to apply changes that will result in improvement. | July 15 th , 2012 | | | | | | | | | | | | | | |

Table 21: QIP - Workforce focus

| <p>QD Problem statement The active participation of labor union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.</p> | <p>Team Members QIP Manager: Administrative Director</p> <p>Working team: Units Directors</p> | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|-----------------------------------|-----------|------------------------------|----------------------------------|--------------|----------------------------------------------------------------------------------|-------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------|
| <p>Tools Survey Workshop Interview Brainstorming</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th style="text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td>Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right;">September 15th, 2011</td> </tr> <tr> <td>Do</td> <td>Implementing the activities.</td> <td style="text-align: right;">February 15th, 2012</td> </tr> <tr> <td>Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right;">April 15th, 2012</td> </tr> <tr> <td>Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right;">August 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | Do | Implementing the activities. | February 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | April 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | August 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | February 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | April 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | August 15 th , 2012 | | | | | | | | | | | | | | |

Table 22: QIP - Curriculum

| <p>QD Problem statement The programs curriculum of the university do not has an international recognition.</p> | <p>Team Members QIP Manager: Academic Affair Director</p> <p>Working team: Deans Programs Coordinators Professors</p> | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|--------------------------------|-----------|------------------------------|-------------------------------|--------------|----------------------------------------------------------------------------------|---------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <p>Tools Self study of each programs Rubrics template Interviews Surveys</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th style="text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td>Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right;">August 15th, 2011</td> </tr> <tr> <td>Do</td> <td>Implementing the activities.</td> <td style="text-align: right;">March 15th, 2012</td> </tr> <tr> <td>Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right;">October 15th, 2012</td> </tr> <tr> <td>Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right;">December 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | Do | Implementing the activities. | March 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | October 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | March 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | October 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 | | | | | | | | | | | | | | |

Table 23: QIP - Faculty Awards

| <p>QD Problem statement There are still several researches that have not participated in national and international contests. This is due to lack of communication performed on these contests at the domestic level.</p> | <p>Team Members QIP Manager: Research Vice-provost Working team: Research Director Professors</p> | | | | | | | | | | | | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|-----------------------------------|-----------|------------------------------|---------------------------------|--------------|----------------------------------------------------------------------------------|------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <p>Tools Interviews Surveys Priority Analysis TQM plan communication strategies</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table border="1"> <thead> <tr> <th></th> <th></th> <th style="text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td>Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right;">September 15th, 2011</td> </tr> <tr> <td>Do</td> <td>Implementing the activities.</td> <td style="text-align: right;">January 15th, 2012</td> </tr> <tr> <td>Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right;">July 15th, 2012</td> </tr> <tr> <td>Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right;">December 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | Do | Implementing the activities. | January 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | July 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | January 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | July 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 | | | | | | | | | | | | | | |

IV. Acceptance

The purpose of the Acceptance phase is to communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO.

The activities that need to be done are the following:

1. Define a communication plan including the stakeholders, their needs and expectation, participation level, stakeholders management strategies, information to be communicated, people in charge of the information dissemination, communication methods and communication frequency.

Table 24: Acceptance

| | A | B | C | D | E | F | G | H |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Prospective student Students Parents of students | Professors | Staff- Union | Top Management | Scientist Community International donor agencies | Other suppliers | Other higher educational institutions | Companies Employers Industrial Sector State Society Professional Schools High Schools |
| Needs & Expectations | <ol style="list-style-type: none"> 1. Profile of the graduate and professional 2. Specializations offered 3. To count on competent Professors education 4. Economic study facilities | <ol style="list-style-type: none"> 1. Facilities for scientific and technological research 2. Recognition to the teaching and research work. 3. Adequate infrastructure for teaching and research | <ol style="list-style-type: none"> 1. Long term labor perspective 2. Perspective to pursue a career 3. Good salary perspective | <ol style="list-style-type: none"> 1. Achieving the mission and strategic intent 2. Compliance with the institutional strategic plan according to their policies 3. Financial ratios of the University 4. Ratio of growth of numbers of students that apply 5. Awards received by the University | <ol style="list-style-type: none"> 1. High quality scientific production 2. Facilities for scientific and technological research | <ol style="list-style-type: none"> 1. To offer goods and services constantly 2. Long-term contracts | <ol style="list-style-type: none"> 1. Number of students 2. Number of vacancies by specialty | <ol style="list-style-type: none"> 1. Programs offered 2. Teaching methodology 3. Competent and qualified human resources 4. Study and work conditions 5. Products of research in science and technology to be applied according to the national reality 6. Contribution to the culture and society development |
| Level of participation | High | High | Medium | High | Low | Low | Low | Medium |

| | A | B | C | D | E | F | G | H |
|-----------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|----------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| | Prospective student Students Parents of students | Professors | Staff- Union | Top Management | Scientist Community International donor agencies | Other suppliers | Other higher educational institutions | Companies Employers Industrial Sector State Society Professional Schools High Schools |
| Strategies for the management of stakeholder | Get information about their requirements and keep them informed of the progress of the project. | Involve them in planning and decision-making for the implementation of the project. | Get information about their requirements and keep them informed of the progress of the project. | Involve them in planning and decision-making for the implementation of the project. | Build alliances Keep them informed | Monitor them | Monitor them | Build alliances Keep them informed |
| Information to be communicated | Overview: mission, vision, strategic intent | Information on mission, vision, strategic intent, objectives, strategies and TQM plan. | Information on mission, vision, strategic intent, objectives, strategies. | Complete information on all aspects of the project. | Overview: mission, vision, strategic intent | Overview: mission, vision, strategic intent. | Overview: mission, vision, strategic intent. | Overview: mission, vision, strategic intent. |
| Responsible for distributing the information | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager |
| Method or technology to transmit information | - Mass communications | - Face to face communication - Presentations - Mass communications | - Mass communications | - Written and/or digital report - Presentations - Face to face communication | - Mass communications | - Mass communications | - Mass communications | - Mass communications |
| Communication frequency | Quarterly | Monthly | Quarterly | Fortnightly/ Biweekly | Quarterly | Half-yearly | Half-yearly | Quarterly |

6 TQM METHODOLOGY VALIDATION

In this chapter the TQM Methodology will be tested and validated to confirm if the development follows the planned arrangements and to ensure that the resulting TQM Plan is capable of meeting the requirements for the specified application.


6.1 TQM methodology verification

The verification has been performed against the steps of the meta-methodology selected of seven steps. A meta-methodology assists the stakeholders to use their domain knowledge to infer new facts following a guided process. In section 4.2 each one of the phases have been followed, accomplishing the purpose of each step and substep.

In section 4.2.7 as it is required by the meta-methodology used, it is internally verified as the seventh and last step of Thomann's meta-methodology.

6.2 Using TQM Methodology to create a TQM Plan


Below is an example of how to use the methodology in a simplified situation. It depicts a TQM Plan of a university that has applied the methodology step by step. This simplified sample is a real-life case of Pontificia Universidad Católica del Peru, which provides sufficient data as input for the process. This section will allow a university to better understand the use of the TQM Methodology and how to obtain the TQM Plan.

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1. University Profile


The ABC University is a private non-profit institution created by Doctor Jorge Dulanto and a group of committed professionals and scholars who signed the bylaws; being recognized by the Country by Supreme Decree of 24 June 1917 including the Colleges of Liberal Arts and Law. It is currently located in the District of San Miguel, 1801 University Avenue. It has a student population of 15,000 undergraduate students and 2,000 graduate students. The number of full time faculty members is 200 and 400 staff.

The ABC University is one of the best in the region. His leadership is exercised on the basis of achieved prestigious factors objective and qualitative as the quality of instructors, graduates, publications in a number of important indexed journals, technological developments, cultural events and activities carried out by the university as an expression of its mission provides a good reputation and legitimacy among their peers and to society in general.

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1.1. Mission, Vision and Values.-

| Mission | Vision | Values | Strategic Intent |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>ABC is an academic community inspired by ethical principles and, creative and diffuser of culture, values and knowledge, promoting change, dedicated to the integral formation of the person that made an instrument of his own realization study and train to assume and resolve fundamental problems inherent to the human being and society.</p> | <p>To lead University education in the country and be recognized nationally and internationally as a generator space for development.</p> | <p>Values form the basis of their organizational culture and mean essential elements that forged the identity of our University provide uniqueness and claim their social presence. They are:</p> <ul style="list-style-type: none"> Search for the truth Respect for the dignity of the person Pluralism Social responsibility and commitment to the development Honesty Solidarity Justice | <p>The ABC University is pursuing to be the first university in Latin America that provides quality education and research of international recognition.</p> |

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1.2. TQM plan Charter (education and research Quality definition)

| | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------------|-------------------|------------------------|-----------------|----------------------|--------------------|-----------------------|-------------------|-----------------------|--|---------------------------|
| <p>Problem Description</p> <p>Perception that there is not an appropriate level of high quality educational and research services to satisfy all the university stakeholders. Perception of urgent need of establishing a challenging vision of the University, including quality measurement objectives for the next 10 years. Perception of need to redesign the current processes.</p> <p>Quality definition for education and research in the university is to satisfy all the stakeholders' requirements.</p> | <p>Team Members</p> <p>TQM Project Manager: Provost</p> <p>Working team:</p> <ul style="list-style-type: none"> Academic Vice Provost Research Vice Provost Academic Affair Director Finance Director Administration Director | | | | | | | | | | | | |
| <p>Tools</p> <ul style="list-style-type: none"> TQM plan template / TQM plan charter Survey/workshop/interview Stakeholder mapping/Brainstorming QD template and validation workshop Priority Analysis TQM plan communication strategies | <p>Project plan/Timeline</p> <p>Start Date: January 15th</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 70%;">Initiation</td> <td style="text-align: right;">Due Date</td> </tr> <tr> <td>Assessment</td> <td style="text-align: right;">March 15th</td> </tr> <tr> <td>Analysis</td> <td style="text-align: right;">May 15th</td> </tr> <tr> <td>Preparation</td> <td style="text-align: right;">June 15th</td> </tr> <tr> <td>Acceptance</td> <td style="text-align: right;">July 15th</td> </tr> <tr> <td></td> <td style="text-align: right;">September 1st</td> </tr> </table> | Initiation | Due Date | Assessment | March 15 th | Analysis | May 15 th | Preparation | June 15 th | Acceptance | July 15 th | | September 1 st |
| Initiation | Due Date | | | | | | | | | | | | |
| Assessment | March 15 th | | | | | | | | | | | | |
| Analysis | May 15 th | | | | | | | | | | | | |
| Preparation | June 15 th | | | | | | | | | | | | |
| Acceptance | July 15 th | | | | | | | | | | | | |
| | September 1 st | | | | | | | | | | | | |

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1.3. Services provided

| | Educational Programs |
|---|----------------------------------------|
| | Undergraduate |
| 1 | Administration and Accountancy college |
| | Administration |
| | Accountancy |
| 2 | Sciences and Engineering college |
| | Physics |
| | Chemistry |
| | Mathematics |
| | Civil Engineering |
| | Mining Engineering |
| | Mechanical Engineering |
| | Mechatronics Engineering |
| | Industrial Engineering |
| | Systems Engineering |
| | Electrical Engineering |
| | Telecommunications Engineering |
| 3 | College of Law |
| | Law |

| | | | |
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| | |
|---|-------------------------------------------|
| 4 | Management and Direction college |
| | Management and Direction |
| | Graduate |
| 1 | Master programs in Industrial Engineering |
| 2 | International MBA |
| 3 | Master programs in Constitutional Law |
| 4 | Doctorate in Law |
| 5 | Doctorate in Business Administration |

| Research Centers and field of research | | |
|----------------------------------------|----------------------------------|--------------------------------------------------------------------------------------------------|
| 1 | Sciences and Engineering College | Areas of physics, chemistry and mathematics. Areas of technology and sustainable development. |
| 2 | Law College | Area of social sciences. |
| 3 | Management and Direction College | Quality, organizational management and environment management area. |

1.4. Stakeholder focus.-

1.4.1. How do you determine the target students and stakeholders of both educational and research services?


There is no way to determine the target students and stakeholders of both educational and research services, 82% of the students are from Lima, and, generally, from private high schools. There is no study about identifying the stakeholders and their needs and expectations. The same case is for the students and stakeholders of research services.

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Each professor selects some investigation areas to develop and looks for organizations that would provide funds, but there is not an institutional plan that guides with a vision and a policy about this activity.

1.4.2. Stakeholder map.


| | | Main stakeholders | |
|---|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| | College | Education services (undergraduate and graduate) | Research |
| 1 | Administration and Accountancy College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers | Students Professors Society Science community Companies |
| 2 | Sciences and Engineering College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers | Students Professors Society Scientist community Companies Industrial Sector |
| 3 | Law College | Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers | Students Professors Society Scientist community Companies The State |

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| | | | |
|---|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 4 | Management and Direction College | The State Students Professors Parents Society Professional Schools High schools Other technical and higher education institutions Employers Industrial sector | Students Professors Society Scientist community Companies Industrial sector |
|---|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|


| Undergraduate Students | | |
|-------------------------------|----------------------------------------|--------------|
| | College | Total |
| 1 | Administration and Accountancy College | 240 |
| 2 | Sciences and Engineering College | 2,894 |
| 3 | Law College | 1,733 |
| 4 | Management and Direction College | 612 |

| Graduate Students | | | | |
|--------------------------|------------------------------------------|-----------|-----------|-------|
| | College | Part-Time | Full-Time | Total |
| 1 | University Graduated School - Masters | 364 | 1458 | 1,822 |
| 2 | University Graduated School - Doctorates | 16 | 66 | 82 |

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| Annual Research Expenditure (in US\$) | | |
|---------------------------------------|----------------------------------|------------------|
| | College | Total |
| 1 | Sciences and Engineering College | US \$ 29,518,586 |
| 2 | Law College | US \$ 17,497,733 |
| 3 | Management and Direction College | US \$ 2,983,681 |

| | | Desired profile of: | | |
|---|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | College | Prospective undergraduate students | Prospective graduate student | Prospective funding institution for research |
| 1 | Administration and Accountancy College | <ul style="list-style-type: none"> • Solid training in basic sciences: mathematics and social sciences. • Numerical ability, verbal reasoning and comprehension, mechanical and abstract reasoning. • Ability to analyze, summarize and relate with teams. • Ease of expression, sociability, broad vision of the world and perspective on possible developments. • Analysis, understanding and reflection of the economic, social, political and administrative environment. • Proactive organizational capacity and leadership. • Ease of accounting, business administration, problem analysis, and diagnosis and solutions proposition. | <ul style="list-style-type: none"> • Bachelor's degree in business administration, accounting or related programs. • Skills and experience in managing teams. • Skill to design solutions to complex problems. • Skill in analytical methods. • Visionary leadership. | Multilateral agencies for funds that allow applied research and development as social Agreement with State Institutions, Foreign Universities, International Programs |
| 2 | Sciences and Engineering | <ul style="list-style-type: none"> • Knowledge of physical, chemical and mathematical | <ul style="list-style-type: none"> • Bachelor's degree in science or engineering or | Agencies multilateral funds to |

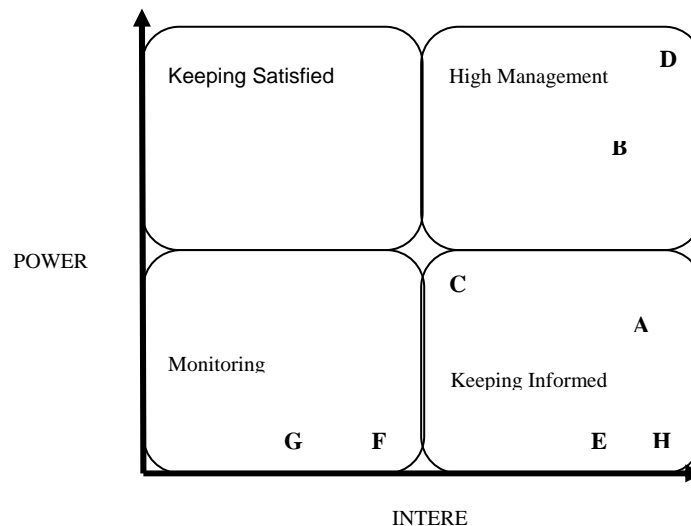
| | | | |
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|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| College | <p>sciences.</p> <ul style="list-style-type: none"> • Knowledge in computational tools. • Skills to perform and interpret technical drawing • Skills to solve new situations. • Ability to develop criteria for problem solving through analysis and synthesis • Spirit of observation to investigate how and why the phenomena • Ability to coordinate and properly express their ideas. • High common sense to distinguish concepts and engineering approaches. • Ability to integrate in an interdisciplinary way. | <p>related careers.</p> <ul style="list-style-type: none"> • Skill and experience in solution of problems, designs products and interdisciplinary integration. • Scientific and technical knowledge in basic disciplines. • Sensitivity to detect problems that can be resolved and interest to contribute to solutions. • Ability to manage databases, programs of simulation, processing text and access to consultation via internet. • Available to carry out research inter and multi-disciplinary. • Inclination for actions to promote the training of human resources, training and transformation and technology innovation. • Professional ethics in the development of scientific research and educational activities. | <p>applied research in quality and social entrepreneurship</p> <p>Agreement with State institutions, foreign universities, international programs.</p> |
| 3 Law College | <ul style="list-style-type: none"> • Calling for Justice. • Altruistic spirit of perseverance. • Discipline for reading. • Good oral and written expression, ability to communicate with this environment • Investigative and restless spirit because of the events of the legal, economic and socio-political environment. • Student with abstract and logical reasoning skills. | <ul style="list-style-type: none"> • Bachelor's degree in Law. • Student tracked with the object of study of the law to make its best effort and put at the service of their professional qualification process. • Aware of the law responds to become an instrument of social control, involving professional exercise a strong ethical framework, scientific rigor and high sense of responsibility. | <p>International institutes of legal research in the areas of Administrative Law, Environmental Law, Information Law, Constitutional Law, Social Law, International Law, Tax Law, Litigation Law And Criminal Law</p> |

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| | | | | |
|---|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | | <ul style="list-style-type: none"> • Tolerant and critical spirit • Honesty and civic-mindedness | <ul style="list-style-type: none"> • Possess interpretive, argumentative and propositional skills. • Willing to commit their specialization studies jointly with the other activities that deal with their personal and professional life. | |
| 4 | Management and Direction College | <ul style="list-style-type: none"> • Solid training in basic sciences and social sciences • Ability to express ideas clearly • Ability to integrate concepts from different disciplines • Willingness to work in team and flexibility • Creativity, innovation and rigor • Capacity for analysis and synthesis • Fluency, sociability. | <ul style="list-style-type: none"> • Bachelor's degree in engineering, management or other related programs. • Managers of enterprises, financial managers, accountants, economists, and other professionals who are playing administrative, executive and managerial functions or aspire to assume them. • Entrepreneurs wishing to update their knowledge. • Entrepreneurs wishing to set up and launch their own business | <p>Multilateral funds agencies to applied research in quality and social development</p> <p>Agreement with State institutions, foreign universities, international programs</p> |

Matrix Power / Interest



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Legend:

A: Prospective student, Students, Parents of students

B: Professors

C: Staffs, labor union

D: Top Management

E: Scientist Community, International donor agencies

F: Other suppliers

G: Other higher educational institutions


H: Companies, Employers, Industrial Sector, State (MINDE), Society, Professional Schools

High Schools

1.4.3. Governance.-

Governing board, central administration, Colleges and Allied Institutions, Research and academic centers:

The administration of the ABC University is by the next authorities and governing board:

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6.2.1 University Assembly

The University Assembly is the top governing body of the University and its main functions are the following:

- Modify the University’s statute and oversee its compliance;
- Elect the Academic Vice – Provost, Research vice-provost and Administrative Vice - Provost;
- Elect, at the Academic Vice - Provost ´s suggestion, the Academic Directors;
- Ratify the Development Plan and the University Operational Plan approved by the University Council;
- Elect the members of the University Electoral Committee
- Making a statement on the Provost´s Annual Review and assessing the operations of the University;
- Agree to the creation, merger, suppression or restructuring of academic units, its programs or Programs.

The University Assembly includes the following members:

- Provost , Research Vice Provost , Administrative Vice Provost and Academic Provost;
- Deans;


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- Ordinary faculty members' representatives;
- Student representatives;
- Peruvian Episcopal Conference representatives (5), designated by the Episcopal Conference.

6.2.2 University Council

The University Council is the superior body of promotion and execution of the University and its main functions are the following:


- Approve, at the President's request, the University's Development and Operation Plans, and submit them to ratification by the University Assembly;
- Approve the Election Regulations, and general and special regulations;
- Propose the creation, merger, suppression or restructuring of academic units or its programs;
- Agree and ratify study and work plans proposed by the different academic units;
- Name, hire, promote, confirm, remove and ratify faculty members and administrative personnel, at the request, in this case, of the respective academic units;

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- Award the academic degrees and professional titles approved by the Colleges, as well as awarding honorific distinctions and recognize and revalidate studies, degrees and titles of foreign universities;
- Approve admission and incorporation modalities, and the number of places for each admission contest;
- Approve the University's annual budget;
- Adopt the measures attaining to the University's economy, accept legacies and donations, and authorize actions and contracts;
- Exert disciplinary power over the faculty members, students and administrative personnel, in the way and degree determined by the regulations;

The University Council is comprised of:

- Provost , research vice Provost , Administrative Vice Provost and Academic Provost;
- Current Deans
- Academic Directors
- Student representatives

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6.2.3 Colleges


The Colleges are the fundamental organization, and academic and professional formation units. They are integrated by faculty members, work force (administrative) and students. In these colleges one or more disciplines or programs are studies through a defined curricular structure

Each college is in charge of a College Board and a Dean. For its better operation, a college may have an Assistant Dean for Academic Programs.

The faculty members that integrate the College Board are elected by the ordinary faculty members for a period of three years and can be re elected.

The University includes the following College:

- Administration and Accountancy
- Sciences and Engineering
- Law
- Management and Direction


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6.2.4 Graduate College

Postgraduate studies are followed in the Graduate College. Postgraduate studies lead to the Master and Doctor Degrees. The Graduate College has academic, administrative and government autonomy.

The Graduate College is run by a Council which is presided over by a Dean and integrated by six ordinary faculty members part of its Professors Board. The Dean of the Graduate College must possess the academic degree of Doctor (or its foreign equivalent) and be a Full Professor of the University for not less than three years and at least ten in teaching functions. The Dean is elected by the College Board for a period of three years and has the same attributions and rights as the Deans of the College.

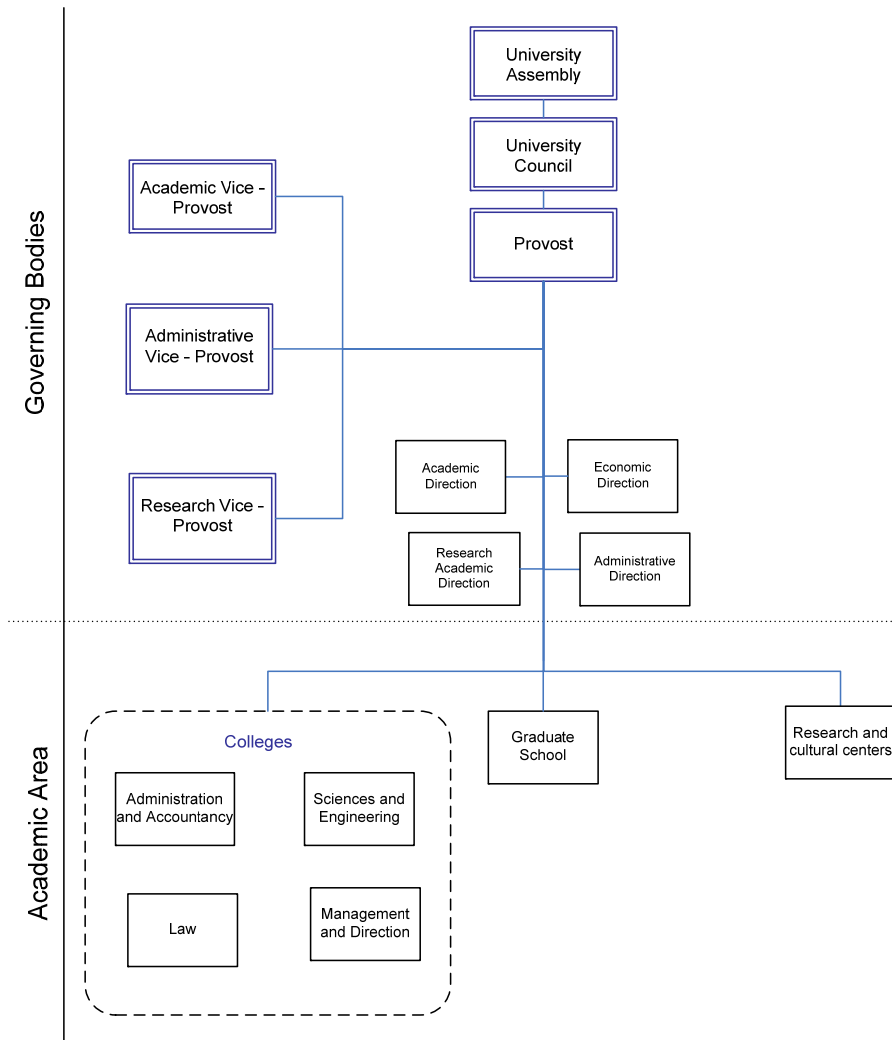
The ABC University complements its academic offer with 14 centers and institutes specialized in the study of different disciplines, such as architecture and urban planning, international affairs, social sciences, culture, education, enterprises and university, geography and environment, humanities, languages, informatics, engineering and democratic institutions. The specialized centers and institutes are the following:


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- Cultural Center
- Dispute Analysis and Resolution Center (Consensos)
- Innovation and Development Center (CIDE)
- Architecture and City Research Center (CIAC)
- Applied Geography Research Center (CIGA)
- Music and Dance Center (CEMDUC)
- Business Center (CENTRUM)
- Advanced Manufacturing Technologies Center (CETAM)
- Pre – University Center (CEPREPUC)
- Corrosion and Protection Institute (ICP)
- Institute for Human Rights and Democracy (Idehpucp)
- Environmental Studies Institute (IDEA)
- International Studies Institute (IDEI)
- Institute for Quality

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Organization Chart-ABC University



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1.4.4. . How does your governance system support the quality levels which your university has?


ABC University is well recognized for the quality of its programs in his country and is proud that the majority of its graduates find employment immediately after graduation. The provost and the Research and Academic Vice Provost are looking for improvement the programs quality and implement some strategies such us the ISO 9001 Quality System Management certificated for each colleges.

The professional internship program and the emphasis on design and team work are important strengths of the engineering programs. Classrooms, offices and laboratories are generally modern and well maintained. The morale of the professors, staff and students is excellent and there is clearly a good collegial attitude across all programs.

1.5. Faculty and staff profile.-

1.5.1. Faculty by time status

The University has 257 full-time Professors and 846 part time Professors, of which 4% correspond to the College of Administration and Accounting, 53% to College of Science and Engineering, 32% to the College of Law and 11% at the College of Management.

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1.5.2. Non-Faculty staff: Central administration, colleges, other.

31% of the staff belongs to the Central Administration, 29 % to the College of Science and Engineering, 20% to the College of Law, College of Management 11% and 9 %.


1.5.3. How do you evaluate and manage your staff and faculty competencies to support the University mission and overall quality?

For the different personal, including the faculty, there are descriptions of their function but it doesn't include their competencies. However there are two mechanisms to evaluate the professors: The course survey at the end of each course and the general satisfactory survey that are applied once a year to all students. For the other staff there is an annual evaluation of their performance that is done by the Administration Direction.

1.6. Resources.-

1.6.1. Library and learning resources


The ABC University has a Central Library and a Specialized Library in each College. The students have access to them for investigation and take information about the field of

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their specialization. Additionally, the university library provides online access to 25 specialized databases, some of these specialized in Sciences and Engineering, such as:

- CSA Science and Technology Research
- Chemical abstracts
- American Chemical Society Archives
- PROLA (Physical Review on-line Archives)
- ACM Portal (Association for Computing Machinery)
- ASTM standards
- American Concrete Institute standards
- American Welding Society standards
- World Telecommunications Indicators (ITU)

Purchasing of bibliographic material is made on the basis of faculty member's requests about subjects related to their programs. Furthermore, the library provides the service of document delivery that complements the material available in its collections. This service is required by students and faculty members for the development of thesis papers and/or research.


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The services provided by these libraries are:

- Integrated online catalogue;
- Library or home loan;
- Purchase of publications;
- Document delivery;
- Inter – library loan with libraries from other institutions such as: British Library, Canada Institute for Scientific and Technical Information, Spanish Superior Council for Scientific Research, the Ibero-American Science and Technology Education Consortium, amongst others;
- Access to online databases, some of them with remote access;
- Training of library resources for users;
- Bibliographic search;
- Monthly bibliographic alters;
- Magazine content tables;
- Wi – Fi Internet connection.

1.6.2. Financial resources: tuition, non-tuition

ABC University has an annual budget of \$530 million; 60% of it belongs to tuition and 40% comes from other sources such as external services, research, financial, funding.

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1.6.3. Physical resources

ABC University has a Central Admission Office, Central Library, Administration and Accountability College (in two buildings), the Science and Engineering College (in three buildings), the Law College (in two buildings), the Management and Direction College, five snack bars, Pre-university Center, the Central Administration, the ABC Theater, Central Auditorium, Sports area, Graduates Association.

1.6.4. How do your resources support the quality levels which your university has? ABC University is continually concerned about the services quality level and assesses if students have all the necessary facilities that allows reaching the programs objectives and if professors can do high quality research.

1.7. Success indicators.-

| Success indicators | | |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| | Education services | Research |
| 1 | Number of freshmen | N° of publications/college/annual |
| 2 | Compliance with quality indicators: Instructor performance Level of satisfaction with facilities and administrative services offered | External investment in research |
| 3 | Number of graduates | Number of doctoral graduates |
| 4 | Student publications in indexed journals. | |

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2. Gap Analysis. - Current situation versus the desired state.

2.1. Quality Dimensions (includes a process map for each quality dimension-SIPOC)

TABLE

| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
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| | | | | | L | I | A | Total |
| GENERAL | | | | | | | | |
| Stakeholder focus | ABC University is recognized as one of the best universities in the country. This is recognition of the quality of its teaching, research, publications, social responsibility, cultural and contribution to academic and institutional leadership. In the administrative, academic and university research processes there are groups participating directly or indirectly. | Current interest groups involved in the university, are working isolated and their development goals for college fail to be cross-functional with other stakeholders. | Bureaucracy in university management. | Identified Stakeholder must be involved in the development of the strategic plan. Also must be transversal processes mention their respective participation in the development and growth of the ABC University. | 3 | 3 | 5 | 45 |
| Governance | The Government and | The main problem with | The Government of the | The powers of | 5 | 3 | 3 | 45 |

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| and administratio n | <p>administration of the University is conformed of a number of departments which are responsible for addressing the University to achieve its vision and mission. Its function is to ensure a suitable administrative, educational and research management processes to meet their objectives.</p> <p>These powers are as follows: The Council University; which is the supreme body of the promotion and implementation of the University Provost; who legally represents the university chairs its governing bodies, runs academic life, administrative management and promotes the research of the institution. Administrative academic and research Vice Provost are responsible for collaborating</p> | <p>the ABC University is the degree of flexibility or stiffness of the structures of their powers to deal with changes in the environment; also the uniformity or diversity of choices within a university system.</p> | <p>University does not have adequate management plans that can cope with possible demands of its staff to organizational change.</p> | <p>Government and administration of the University must develop transversal action plans involving a prior analysis of the environment and the impacts that might have on their staff. The powers of the University must maintain the same structure but make their processes more flexible and capable of responding effectively to the changing environment.</p> | | | | |

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| | | | | | L | I | A | Total |
| | with the Provost on tasks with the Assembly and University Council. Academic directors, which are made up of elected schools Professors. | | | | | | | |
| Strategic Planning | University strategic planning takes place based on the strategic institutional Plan. This Plan shows processes, strategic objectives and institutional goals aimed at improving the performance of the ABC University in the areas of research, training and social responsibility with the participation of the entire University community Members of our community among Professors, students, graduates, staff and authorities are involved in the development of the strategic planning. | The main problem observed in strategic planning is that while the University advanced significantly improves the quality of what is delivered to the members of the University community and society, this development was stronger and more visible within the processes of management and administrative support than the academic activity or social responsibility level. | University more emphasized to the administrative management in order to provide better service to meet the needs of its customers. | The University Strategic Plan should focus on three important fronts: management and administrative support, academic activity and Social responsibility, and promotion of the scientific and technological research. | 5 | 3 | 5 | 75 |
| Leadership | The ABC University | The problem presented in | Ignorance of the | ABC University | 3 | 3 | 5 | 45 |

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| | <p>leadership is exercised on the basis of achieved prestigious factors objective and qualitative as the quality of Professors, the prestige of graduates, the quality of academic publications, technological developments, cultural events and all activities carried out by the University as an expression mission alive and giving it a reputation and legitimacy among their peers and to society in general.</p> <p>The ABC University has been able to employ its recognition and institutional leadership for creative purposes, promotion of academic and scientific development and as a source of authoritative opinion on the problems of the country.</p> | <p>the leadership, is perceived by some Professors who adopt an authoritarian style to certain situations that face University (relations with stakeholders).</p> | <p>strategic plan, not having clear goals and objectives and not having transversal processes generate authoritarian leadership models in some units of the University.</p> | <p>leadership should focus on a combination of two types of leadership styles:</p> <p>Transformational leadership: involves transforming subordinates challenging them to rise above their needs and immediate interests.</p> <p>Transactional leadership: Involves using techniques how the motivate subordinates working under rewards or punishments.</p> | | | | |
| Financial | The ABC University is a non-profit institution. The | The realization of financial operations for | The University does not have an automated | The ABC University must | 3 | 1 | 5 | 15 |

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| | <p>economic resources come from income, legacy and donations from natural or legal persons, and the public contribution provided by the State. As well as the borrowing requirement for investment in research and development projects.</p> <p>The payment for academic rights will be according to the tiered pension system, economic potential individual or family, or by other arrangements the University Council may establish.</p> <p>Also the ABC University maintains grants and loans to certain students. The draft annual budget of the University shall be prepared by the Area of Economy, having consideration of the Operation Plan, income and academic units and services and of the Central Administration</p> | <p>the calculation of risk scenarios for the financing and investment, are made operatively using spreadsheets.</p> <p>This creates difficulty and delay in obtaining clear and accurate information for decision-making.</p> | <p>system to perform financial calculations faster.</p> | <p>have an automated accounting and financial and ERP to speed up its administrative processes.</p> | | | | |

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| | proposals. | | | | | | | |
| Process management | <p>ABC University is aware that the success of management depends, increasingly, that its processes are aligned with their strategic vision, mission and objectives.</p> <p>Therefore, the university has units that are under a certified or accredited Quality Management.</p> <p>These units with QMS (certified or accredited ones) seek to identify customer requirements and achieve their satisfaction and / or ensure that the methodologies used to obtain the results are reliable.</p> | <p>The main problem is that the units with a QMS certified or accredited have been developed without considering the traceability of the processes that apply to the entire organization. This causes that the QMS units are managed as "islands" and are not contributed to the objectives of the university.</p> | <p>The implementation of the QMS of the units of the University was at various times and at the request of the headquarters or units of each of them. Same consultants were not always involved in the implementation process and criteria used were different for each type of system.</p> | <p>The QMS of the units of the University must be transversal processes interact with other units and will be the basis for the implementation of other automated as ERP systems.</p> | 3 | 3 | 3 | 27 |
| Faculty | <p>ABC University has a part-time and full-time faculty at both undergraduate and graduate studies. The majority of professors do some research.</p> | <p>Learning styles of full-time and part-time professors vary by time teaching experience and professional degree. It has a significant impact on teaching and learning</p> | <p>The University has no an appropriate program of training for Professors, no matter their teaching time. Processes to carry out the programs have no</p> | <p>The University should promote research into all Professors. Consider as a criterion for evaluation of</p> | 5 | 3 | 3 | 45 |

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| | <p>To be a faculty member, professor candidates must meet the following requirements:</p> <ul style="list-style-type: none"> • Having the academic degree of Doctor, Master's or professional degree • Winning the university contest organized by the Academic Department to cover the respective vacancy. <p>Also, there is a mechanism for evaluation and promotion of Professors.</p> <p>This mechanism considers 3 criteria: Category, professional degree and Performance Evaluation.</p> | <p>achieved.</p> <p>It also notes that the ratio teacher / student ratio is low.</p> | <p>clear criteria to identify training needs by type of Professors.</p> | <p>teacher research and publications made by them.</p> | | | | |
| Workforce focus | <p>ABC University has tenure and non tenure staff (part-time and full time) to perform the designated activities for each college.</p> <p>The administrative staff is</p> | <p>The active participation of labor union in the strategic decisions of the university has meant an obstacle for the implementation of</p> | <p>The labor force, as part of the Union of the University, is people that prioritize their personal interests on the interests of the</p> | <p>The University seeks mechanism for sensitization and awareness of all employees in achieving</p> | 5 | 3 | 5 | 75 |

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| | | | | | L | I | A | Total |
| | made up of: workers, secretaries, assistants, analysts, coordinators, supervisors, consultants, managers and directors. Administrative staff works in different units of the university and bring support to faculty and the others research projects. | strategic objectives within the deadlines. For example: To schedule training, the labor union requested that these be made between the hours of work, but for the University this means having to pay extra man-hours in order to do daily activities. | University. This hinders the development and improvement of processes. | compliance with organizational goals and objectives. | | | | |
| Additional success quality indicators | N.A | N.A | N.A | N.A | | | | |
| EDUCATION | | | | | | | | |
| Students focus | Admission: There are 4 admission modalities to the university; they target different prospect students, depending on age and/or personal aptitudes: Talent Examination, Examination for Honor | The grades attributed to students are generally low and failure rates are high. | The grading scheme used is much harsher than other that used in most other countries This is not only demoralizing for the students but also puts PUCP graduates at a | The grading standards in the program should be reconsidered and standardization with other universities. | 3 | 3 | 3 | 27 |

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| | <p>Students, High School Honor Program and Direct Admission via Pre-University Center.</p> <p>Students are examined in Math, Physics and writing skills in order to assure a standard level due to differences in High Schools. Depending on his/her test scores, students shall take Introductory Studies courses or start his/her first semester as a regular freshman.</p> <p>Graduates Students are examined in Math and Writing, besides of interviews, in order to be admitted at the university.</p> <p>The tuition fees charged to admit students are a function of their financial status.</p> | <p>Although there is an office that brings advising, there are few students that ask for it.</p> | <p>disadvantage when they are evaluated for graduate studies or jobs in other countries</p> <p>The attention time of professors for advising doesn't fit for students. There aren't enough professors to attend all students.</p> | <p>Assigning some students to each professor, whose attention time isn't rigid. Students can make meetings with their advisor taking into account their own studying schedule. Nowadays, advisors are just full time professors. PT professors can help with some advising in order to attend more students.</p> | | | | |

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| | <p><u>Evaluating Student Performance:</u> The evaluation system is absolute; the grades are numeric values between "0" and "20." Students will graduate if they successfully pass all the required and elective courses with a grade greater of equal to 11. Furthermore, they are required to pass a test on proficiency in English (reading).</p> <p>The students who flunk a required course must take it again. If the course is an elective one, the students may or may not take it again; in the latter case, they must take another elective.</p> <p>Via university intranet, students may complete all steps for course registration.</p> | | | | | | | |

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| | | | | | L | I | A | Total |
| | <p>At intranet, students are presented with all the courses they can take; they are chosen based on the course requirements.</p> <p>Furthermore, intranet allows the Program Coordinator and some faculty members to access the academic record of a particular student since he/she was admitted in the university, i.e.: course load per semester, grades and the number of time he/she has registered for a particular course.</p> <p><u>Advising Students:</u> The Office of Orientation, Information and Student Support is a department of the university and their staff is a multidisciplinary group of professionals from the</p> | | | | | | | |

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| | | | | | L | I | A | Total |
| | <p>academic areas of Sciences, Engineering and Humanities and the area of Social Support (PUCP's social services) who work to give advice, information and permanent support to students.</p> <p>The main goals of this department are: To gather knowledge about the needs, difficulties and interests of students, aiming to improve the academic environment and to assist the student with vocational orientation.</p> <p>To create channels to increase the participation, motivation, integration and compromise of the student with the University.</p> <p>Seek information to elaborate a diagnosis for the academic and</p> | | | | | | | |

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| | | | | | L | I | A | Total |
| | vocational status of the university students in order to develop new policies based on facts. | | | | | | | |
| Program educational objectives and student outcomes | The university has a general profile for undergraduates and graduates of the university. | The university ABC doesn't have program educational objectives for each career. | The university didn't have the necessity of establishing and measuring educational objectives because there wasn't direct competition in education. Nowadays, there are several universities with several programs options and the market has become more demanding. Also, the amount of students that go to other countries to studies or works has been increasing. | Establishing program | 5 | 5 | 5 | 125 |
| Curriculum | The Program Curriculum involves the preparation of | The programs curriculum of the university do not | The university didn't have the necessity of | Establishing program | 5 | 5 | 5 | 125 |

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| | | | | | L | I | A | Total |
| | <p>students for engineering professional practice. In order to achieve this, the course contents cover an adequate group of subject areas.</p> <p>The Area Coordinators are in charge of compliance from the faculty members in their respective areas regarding curriculum and course content. The Area Coordinators are helped by the Course Coordinators, who notify them if there are any irregularities in the fulfillment of the Curriculum or if they want to make any change to it or to the contents of a particular course.</p> <p>The Area Coordinators provide information about these changes to the FT faculty members. Any change in the Curriculum is discussed and</p> | has an international recognition. | establishing and measuring educational objectives because there wasn't direct competition in education. Nowadays, there are several universities with several programs options and the market has become more demanding. Also, the amount of students that go to other countries to studies or works has been increasing. | <p>educational objectives for each program, both undergraduates and graduates programs. Measuring program educational objectives with periodicity in order to know what is the achieving of the professional profile. Working to obtain the accreditation (international recognition) of the programs curriculum.</p> | | | | |

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| | <p>pre approved by these group of Professors and by the Program Coordinator.</p> <p>However, the Area Coordinators are not the only ones that propose changes. These can be proposed by any faculty member or by the Dean.</p> <p>The Program Coordinator must attend every semester to meetings scheduled with the Assistant Dean for Academic Programs, communicating him/her the proposed changes to the Curriculum. The Assistant Dean for Academic Programs must in turn present these changes to the Dean.</p> <p>The Dean must submit any changes to the Curriculum to the School Board for its</p> | | | | | | | |

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| | | | | | L | I | A | Total |
| | respective approval. | | | | | | | |
| Learning facilities | <p><u>Classrooms</u></p> <p>The classrooms used for the program are located in multi – purpose buildings throughout the university campus. The number of classrooms in the first two is seventy (70). These classrooms are shared by all the programs according to a varying class demand every semester. The capacity of each classroom is variable.</p> <p>Every classroom has a personal computer, with Windows XP operating system, Internet access (this includes access to PUCP's intranet). The computers are loaded with the software required for the specific class. All classrooms are equipped</p> | The amount of students has increased in the last five years and the capacity of classrooms, laboratories and libraries is very limited and is dispersed in several buildings. | In the last five years, the number of students has increased and the university's response to this increase has been slow. | Building new laboratories, libraries and classrooms in order to satisfy current and future student's capacity. | 3 | 3 | 3 | 27 |

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| | <p>with a multimedia projection system and a blackboard and have the Tables and chairs required by the assigned capacity.</p> <p><u>Laboratory Facilities</u> The program has a number of laboratories that allow the practice of experiments and the development of projects related to the courses offered in the study plan. All the laboratories have equipment, measurement instruments and software tools that fulfill the program's requirements.</p> <p>The planning for new acquisitions and the scheduling of maintenance takes place every year, these activities are performed by the Section Coordinator, with the support of his/her Assistant and</p> | | | | | | | |

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| | <p>Secretary. These activities happen as a result of a request from the Professors involved in the laboratory courses.</p> <p>The process of selection evaluation and proposal of software tools for the laboratories is an activity that the Section Coordinator has delegated to a FTF teacher. The budget for acquisitions, operation and maintenance is covered by the University.</p> <p><u>Library</u> The students have access to several libraries. The characteristics of each one depend on the field of specialization.</p> <p>The libraries are open to the students from 8:00 a.m. to 10:00 p.m. from Monday to</p> | | | | | | | |

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| | | | | | L | I | A | Total |
| | Friday, and from 8:00 a.m. to 6:00 p.m. on Saturdays. Moreover, there is an online catalogue of books that allows to search and reserve copies. Additionally, the university library provides online access (via intranet) to 25 databases. | | | | | | | |
| International students | It is applicable to students from foreign universities who wish to extend their knowledge to register on regular or special courses offered by the University. This registration is for a maximum of two semesters and does not lead to a degree or title. All courses are offered in Spanish, so students must have good Spanish skills. | International students do not have the opportunity of obtaining a degree or title as a result of their studies at the university. | The programs of the university do not have an international recognition. | Working to obtain the accreditation (international recognition) of the programs curriculum in order to recognize courses. | 3 | 3 | 3 | 27 |
| International faculty | International Faculty members are known professionals in their field and bring a unique expertise to the Faculty. | There are not policy and standard procedure of teaching with foreign faculty at the university. | At first, the university didn't have the need of having procedures and policy because the | Establishing policy and procedures in order to have a standard way of | 3 | 3 | 3 | 27 |

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| | | | | | L | I | A | Total |
| | | | quantity of international faculty was low. Nowadays, this number has increased and each college has its own way to work. | selection, hiring and teaching. | | | | |
| Additional success quality indicators | N.A | N.A | N.A | N.A | | | | |
| RESEARCH | | | | | | | | |
| Total research expenditures | The ABC University considers research as generating knowledge activity and an essential dimension of University activity, carried out by Professors and students grouped in various colleges, centers and institutes, according to the characteristics of each of the instances. The Vice President for Research is in charge of | While it has the support to research in the various colleges and university centers, observing that the promotion is more oriented to further promote the development of research project implementation and dissemination of results. | | | | | | |

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| | | | | | L | I | A | Total |
| | <p>incentives, finance, coordinate and disseminate the research efforts at our University is</p> <p>The lines of research defined in the ABC University are:</p> <p>Individual research lines: they are those that each teacher provides freely and permit to identify its priority areas of interest and dedication. They are weighted on the broader comprehensive evaluation of the teaching that is carried out by the Coordinator of the Section and the Head of Department.</p> <p>Sector research topics: they are those established in sections or departments from the confluence of researchers on a line to the strengthen and project. They are defined with the endorsement of the Coordinator of the Section and</p> | | | | | | | |

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| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | <p>the Head of the Department; evaluated continuously by these bodies and regularly, in its "consistency", by academic research management.</p> <p>Matrix research lines: they are those which are proposals from the synergy between sector research topics, as well as the needs of the environment and the broader institutional development prospects. They are defined by the Academic Research Management, permanently evaluated by this instance and regularly by an "ad hoc" Committee appointed by the Rector.</p> <p>Annually the ABC University makes expenditures investigation of approximately \$ 50 million.</p> | | | | | | | |

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|-----------------|----------------------------------------|------------------|---------------|
| ABC | UNIVERSITY NAME: ABC UNIVERSITY | | |
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| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | Colleges that perform more research expenses are those of Science and Engineering and Law. | | | | | | | |
| Doctoral degrees awarded | <p>The ABC University has more than 100 doctor's graduates of its graduate school. Their offered doctoral degrees are in the following specializations:</p> <p>Doctorate in Law Doctorate in Physics Doctorate in Mathematics</p> <p>All these doctorates have duration of 2 years and are dictated in an inter-daily frequency and in the evenings. The schedule was appropriate based on requests from students.</p> | Most graduates of the doctoral students usually performed only a research to obtain the PhD degree. Afterwards, participation in research is not much, and they are more focused in administrative activities than pedagogical education. | | | | | | |
| Papers indexed | The ABC University has conducted various scientific and technological publications from various sources such as the Science Citation Index | Some publications in research carried out in the current year are not yet indexed. Time to run this process tends to take in | | | | | | |

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| ABC | UNIVERSITY NAME: ABC UNIVERSITY | | |
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| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | (SCI) and the Social Science Citation Index (SSCI), which are administered by the Institute for Scientific Information (ISI) who publishes Journal Citations Report. | some cases more than one year. | | | | | | |
| Citations per Faculty member | Research work of scientific and technological nature carried out by the ABC University is identified as important for his contribution to the development of society issues. Many of the publications in journals have been taken by other educational institutions and research centers, as a reference for the development of other research. | In the ABC University there is the problem to cite Professors in publications. In many cases the way of writing the name and surname with abbreviations, varies according to criterion of the researcher. Standardization is needed. | | | | | | |
| Faculty awards | The ABC University annually organize a contest in which rewards the best projects and research work carried out by the different colleges and units | There are still many of researches that are not submitted to national and international contests. This is due to low | | | | | | |

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| | AS-IS | QD Problem statement | Potential Causes | TO-BE | QPN | | | |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|------------------|-------|-----|---|---|-------|
| | | | | | L | I | A | Total |
| | that make up. Also the various colleges compete at the national and international level to present their research work. | diffusion performed on these contests at the domestic level. | | | | | | |
| Additional success quality indicators | N.A | N.A | N.A | N.A | | | | |

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3. QIPs charter

QIP 01: Strategic Planning

QD Problem statement

The active participation of labor union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.

For example: To schedule training, the labor union requested that these be made between the hours of work, but for the University this means having to pay extra man-hours in order to do daily activities

Team Members

QIP Manager: Rector
 Working team:
 Vice Provost Offices
 Academics y Administrative Directors

Tools

Survey
 Workshop
 Interview

Project plan/Timeline


Start Date: July 15th

| | | Due Date |
|--------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 |
| Do | Implementing the activities. | December 15 th , 2011 |
| Check | Measuring the activities and comparing the results against the expected results. | March 15 th , 2012 |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | July 15 th 2012 |

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QIP 02: Workforce focus

| <p>QD Problem statement</p> <p>The active participation of labor union in the strategic decisions of the university has meant an obstacle for the implementation of strategic objectives within the deadlines.</p> <p>For example: To schedule training, the labor union requested that these be made between the hours of work, but for the University this means having to pay extra man-hours in order to do daily activities</p> | <p>Team Members</p> <p>QIP Manager: Administrative Director</p> <p>Working team: Units Directors</p> | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|----------------------------------|-----------|------------------------------|----------------------------------|--------------|----------------------------------------------------------------------------------|-------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------|
| <p>Tools</p> <p>Survey Workshop Interview Brainstorming</p> | <p>Project plan/Timeline</p> <p>Start Date: July 15th</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 70%;"></th> <th style="width: 20%; text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right;">September 5th, 2011</td> </tr> <tr> <td style="text-align: right;">Do</td> <td>Implementing the activities.</td> <td style="text-align: right;">February 15th, 2012</td> </tr> <tr> <td style="text-align: right;">Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right;">April 15th, 2012</td> </tr> <tr> <td style="text-align: right;">Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right;">August 15th 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 5 th , 2011 | Do | Implementing the activities. | February 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | April 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | August 15 th 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 5 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | February 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | April 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | August 15 th 2012 | | | | | | | | | | | | | | |

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QIP 03: Curriculum

| <p>QD Problem statement The programs curriculum of the university do not has an international recognition.</p> | <p>Team Members QIP Manager: Academic Affair Director</p> <p>Working team: Deans Programs Coordinators Professors</p> | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|--------------------------------|-----------|------------------------------|-------------------------------|--------------|----------------------------------------------------------------------------------|---------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <p>Tools Self study of each programs Rubrics template Interviews Surveys</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 70%;"></th> <th style="width: 20%; text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right; vertical-align: top;">August 15th, 2011</td> </tr> <tr> <td style="vertical-align: top;">Do</td> <td>Implementing the activities.</td> <td style="text-align: right; vertical-align: top;">March 15th, 2012</td> </tr> <tr> <td style="vertical-align: top;">Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right; vertical-align: top;">October 15th, 2012</td> </tr> <tr> <td style="vertical-align: top;">Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right; vertical-align: top;">December 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | Do | Implementing the activities. | March 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | October 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | August 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | March 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | October 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 | | | | | | | | | | | | | | |

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QIP 04: Faculty Awards

| <p>QD Problem statement There are still many of researches that are not submitted to national and international contests. This is due to low diffusion performed on these contests at the domestic level.</p> | <p>Team Members QIP Manager: Office of the Vicepresident for Research Working team: Research Director Professors</p> | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|--|-----------------|-------------|----------------------------------------------------------------------------------------------------|-----------------------------------|-----------|------------------------------|---------------------------------|--------------|----------------------------------------------------------------------------------|------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------|----------------------------------|
| <p>Tools Interviews Surveys Priority Analysis TQM plan communication strategies</p> | <p>Project plan/Timeline Start Date: July 15th</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%;"></th> <th style="width: 70%;"></th> <th style="width: 20%; text-align: right;">Due Date</th> </tr> </thead> <tbody> <tr> <td style="vertical-align: top;">Plan</td> <td>Establishing the activities necessary to deliver results in accordance with the problem statement.</td> <td style="text-align: right; vertical-align: top;">September 15th, 2011</td> </tr> <tr> <td style="vertical-align: top;">Do</td> <td>Implementing the activities.</td> <td style="text-align: right; vertical-align: top;">January 15th, 2012</td> </tr> <tr> <td style="vertical-align: top;">Check</td> <td>Measuring the activities and comparing the results against the expected results.</td> <td style="text-align: right; vertical-align: top;">July 15th, 2012</td> </tr> <tr> <td style="vertical-align: top;">Act</td> <td>Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement.</td> <td style="text-align: right; vertical-align: top;">December 15th, 2012</td> </tr> </tbody> </table> | | | Due Date | Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | Do | Implementing the activities. | January 15 th , 2012 | Check | Measuring the activities and comparing the results against the expected results. | July 15 th , 2012 | Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 |
| | | Due Date | | | | | | | | | | | | | | |
| Plan | Establishing the activities necessary to deliver results in accordance with the problem statement. | September 15 th , 2011 | | | | | | | | | | | | | | |
| Do | Implementing the activities. | January 15 th , 2012 | | | | | | | | | | | | | | |
| Check | Measuring the activities and comparing the results against the expected results. | July 15 th , 2012 | | | | | | | | | | | | | | |
| Act | Analyzing the differences to determine their cause. Determining where to apply changes that will include improvement. | December 15 th , 2012 | | | | | | | | | | | | | | |


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4. Communication plan

| | A | B | C | D | E | F | G | H |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Prospective student Students Parents of students | Professors | Force workers Labor union | Top Management | Scientist Community International donor agencies | Other suppliers | Other higher educational institutions | Companies Employers Industrial Sector State (MINDE) Society Professional Schools High Schools |
| Needs & Expectations | 5. Profile of the graduate and professional 6. Specializations offered 7. To count on competent Professors training education 8. Economic study facilities | 4. Facilities for scientific and technological research 5. Recognition to the teaching and research labor. 6. Adequate infrastructure for teaching and research | 4. Long term labor perspective 5. Perspective to pursue a career 6. Good salary perspective | 6. Achieving the mission and strategic attempt 7. Compliance with the institutional strategic plan according to their policies 8. Financial ratios of the University | 3. High quality scientific production 4. Facilities for scientific and technological research | 3. To offer goods and services constantly 4. Long-term contracts | 3. Number of students 4. Number of vacancies by specialty | 7. Programs offered 8. Teaching methodology 9. Competent and qualified human resource 10. Study and work conditions 11. Products of research in science and technology to be applied according to the national reality |

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|  | UNIVERSITY NAME: ABC UNIVERSITY | | |
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| | A | B | C | D | E | F | G | H |
|----------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| | Prospective student Students Parents of students | Professors | Force workers Labor union | Top Management | Scientist Community International donor agencies | Other suppliers | Other higher educational institutions | Companies Employers Industrial Sector State (MINDE) Society Professional Schools High Schools |
| | | | | 9. Ratio of growth of numbers of students that postulate 10. Awards received by the University | | | 54 | 12. Contribution to the culture and society development |
| Level of participation | High | High | Medium | High | Low | Low | Null | Medium |
| Strategies for the management of stakeholder | Get information about their requirements and keep them informed of the progress of the project. | Involve them in planning and decision-making for the implementation of the project. | Get information about their requirements and keep them informed of the progress of the project. | Involve them in planning and decision-making for the implementation of the project. | Build alliances Keep them informed | Monitor them | Monitor them | Build alliances Keep them informed |
| Information to be communicated | Overview: mission, vision, strategic intent | Information on mission, vision, strategic intent, | Information on mission, vision, strategic intent, | Complete information on all aspects of | Overview: mission, vision, strategic intent | Overview: mission, vision, strategic intent. | Overview: mission, vision, strategic intent. | Overview: mission, vision, strategic intent. |

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| | A | B | C | D | E | F | G | H |
|----------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------|------------------------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------|-----------------------|---------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| | Prospective student Students Parents of students | Professors | Force workers Labor union | Top Management | Scientist Community International donor agencies | Other suppliers | Other higher educational institutions | Companies Employers Industrial Sector State (MINDE) Society Professional Schools High Schools |
| | | objectives, strategies and TQM plan. | objectives, strategies. | the project. | | | | |
| Responsible for distributing the information | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager | Project Manager |
| Method or technology to transmit information | - Mass communications | - Face to face communication - Presentations - Mass communications | - Mass communications | - Written and/or digital report - Presentations - Face to face communication | - Mass communications | - Mass communications | - Mass communications | - Mass communications |
| Communication frequency | Quarterly | Monthly | Quarterly | Fortnightly/ Biweekly | Quarterly | Half-yearly | Half-yearly | Quarterly |

6.3 Subject matter experts survey

As a part of the validation process, a face validation approach has been used, selecting subject matter experts to obtain feedback and external input regarding whether the TQM Methodology and the TQM Plan are capable of meeting the requirements and deliver the intended results. Face validation relies on natural human intelligence, showing that processes and outcomes are reasonable and plausible within the frame of theoretic basis and implicit knowledge of system experts (Klugl, 2008).

6.3.1 TQM Methodology validation

For validating the TQM Methodology a form (Figures 55, 56, 57 and 58) was developed and subject matter experts (SME) were selected. The objective is to test the purpose and gather feedback from experts in the field. Following is the four page form that was submitted to the experts along with the TQM Methodology. The selected experts are:

- **Manu Vora:** BS, MS, MBA and PhD, former Vicepresident of the American Society for Quality as well as fellow. He has worked for more than 17 years in AT&T Bell Laboratories, and is currently an Adjunct Faculty member at various Chicago business schools
- **Daniel Sniezek:** Lockheed Martin Six Sigma Black Belt, American Society for Quality fellow, IEEE Senior, ASQ Regional Director and SUNY Council. Experience in TQM, Lean, Six Sigma.

TQM Methodology for Universities:

Initiation-Assessment-Analysis-Preparation-Acceptance

(Flores-Molina, 2011)

Purpose of the Methodology: to develop a TQM Methodology for universities, which will lead to the preparation of a TQM Plan.

Scope of application: Universities

Description:

The proposed TQM methodology is developed, following a seven-step meta-methodology. The proposed methodology guides the user to develop a TQM plan in five sequential phases: initiation, assessment, analysis, preparation and acceptance. IAAPA stands for: initiation, assessment, analysis, preparation and acceptance, and is the name of the proposed TQM Methodology. Each one of the phases includes its purpose, deliverables, key activities and tools.

Figure 55: Page 1 Subject Matter Expert TQM Methodology Form

| | INITIATION | ASSESSMENT | ANALYSIS | PREPARATION | ACCEPTANCE |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PURPOSE: | To have information from University and preliminary agreement of scope, goals and stakeholders for TQM Plan. | To identify the Quality Dimensions and baseline and evaluate state of the art in quality. | To study and verify the causes of the current quality levels and select the significant areas for improvement. | To prepare the final draft of TQM Plan including selection of improvement projects, roles and responsibilities. | To communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO. |
| DESCRIPTION: | 1. University profile, its context and strategic intent. 2. University identifies the community to which the services are aimed to, stakeholders. 3. University definition of quality in education and quality in research. 4. Proof of the need why improve. Drivers for improvement. | 1. Understand the current state of the quality of university education and research. 2. Measure the current state of the quality of the university. 3. Define what level of quality the university aims to achieve as well as its benefits. | 1. Analyze the causes of the current status of quality, identifying the processes involved and their roles. 2. Define Key Areas for Quality Improvement. | 1. Update TQM Plan Charter 2. Define and Develop improvement projects (QP) associated with each KAQI in a program. 3. Define roles and responsibilities 4. Document TQM Plan. | 1. Communicate properly the TQM Plan to involve the university community. 2. Obtain authorization from the authorities to advance to TQM Plan implementation and have collective acceptance to ensure success. |
| KEY ACTIVITIES: | 1. Collect state of the art information of the university. 2. Document and update the strategic list of. 3. Create and validate the stakeholder map. 4. Develop and update quality definitions. 5. Prepare the first draft of TQM Plan Charter (including proof of need). | 1. Validate QD and describe the state of the art. If applicable, define a QD problem statement. 2. Assess the state of the art in each QD: H, M, L. 3. Build the proposed To-Be situation in each QD. 4. Identify the processes associated with each QD, including inputs, outputs and process factors. | 1. For each QD, analyze the process flow and generate ideas to explain potential causes of undesired as-is situation. 2. For each QD, select the main possible root cause. 3. Update problem statement for each QD. 4. Identify KAQI by prioritizing QD. | 1. Update and validate TQM Plan Charter. 2. Devise QP (including QP charter) for each KAQI. 3. Prepare the final document of the TQM Plan. | 1. Create communication plan, selecting key actors for feedback. 2. Communicate TQM plan and ask for feedback. 3. Review and update TQM plan with feedback collected including proof of the need statement. 4. Obtain Commitment from Top Management and key actors. 5. Obtain written authorization for TQM Plan implementation. |
| DELIVERABLES: | 1. Profile documentation: Mission, Vision, Values, Services provided, stakeholder focus, governance system, faculty and staff, key resources, success indicators. 2. Strategic intent. 3. Stakeholder map. 4. Quality definitions in education and research. 5. TQM Plan charter (problem statement, quality goal, scope, timeline, roles and responsibilities) | 1. Quality Dimensions document. 2. Gap study: Baseline As-Is and To-Be. 3. Measurement in each Quality Dimension. Measure (High, Medium, Low) 4. Maps of processes associated with QD. | 1. SIPOC analysis. 2. Documentation of the possible causes of quality problems. 3. QD problem statement updated. 4. List of key QD with priority (QPN). 5. Define Key Areas for Quality Improvement (KAQI). | 1. TQM Plan charter updated 2. TQM Plan documented | 1. TQM Plan Communication Plan. 2. Feedback document 3. TQM plan updated and final document. 4. TQM Plan authorized. |
| TOOLS: | 1. Interview. 2. Workshop (SI). 3. Stakeholder mapping. 4. Survey/Brainstorming. 5. TQM Plan Charter template (including proof of the need statement). | 1. QD Template and validation workshop / Interview state-of-the-art 2. Scoring template. 3. To-Be Workshop. 4. SIPOC development. | 1. Brainstorming + SIPOC Analysis. 2. C&E matrix. 3. Problem statement TQM Plan template. 4. Significance QPN matrix. | 1. TQM Plan charter template / update workshop. 2. Project selection (including Project Charter template). 3. TQM Plan template. | 1. TQM Plan communication template. 2. Stakeholder dialogue. 3. TQM Plan template (updated). 4. TQM Plan workshop program and engagement plan. |

Figure 56: Page 2 Subject Matter Expert TQM Methodology Form

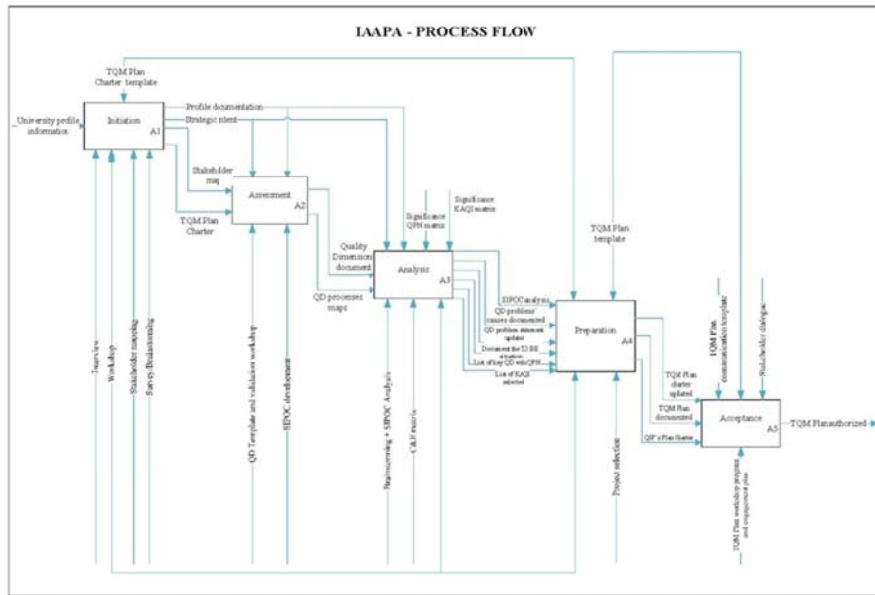


Figure 57: Page 3 Subject Matter Expert TQM Methodology Form

Subject Matter expert qualification Report: TQM Methodology

Name: _____

Experience/Position/Background: _____

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | | Strongly agree | Agree | Disagree | Strongly disagree |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|----------|-------------------|
| 1 | Is the methodology developed good enough to produce a good quality improvement plan for a university, that will make it consistent with its mission. | 4 | 3 | 2 | 1 |
| 2 | The Initiation phase accomplishes its purpose. | 4 | 3 | 2 | 1 |
| 3 | The Assessment phase accomplishes its purpose. | 4 | 3 | 2 | 1 |
| 4 | The Analysis phase accomplishes its purpose. | 4 | 3 | 2 | 1 |
| 5 | The Preparation phase accomplishes its purpose. | 4 | 3 | 2 | 1 |
| 6 | The Acceptance phase accomplishes its purpose. | 4 | 3 | 2 | 1 |
| 7 | IAPPA methodology accomplishes its purpose of developing a good TQM Plan. | 4 | 3 | 2 | 1 |
| 8 | IAPPA methodology is feasible to being adapted for its use in other sectors or industries, beyond Higher Education | 4 | 3 | 2 | 1 |

Figure 58: Page 4 Subject Matter Expert TQM Methodology Form

6.3.2 TQM Methodology Subject Matter Expert Surveys

Both experts strongly agree with items 1, 2, 3, 6, 7 and 8, which mean they consider that the methodology is good enough to produce a good TQM Plan for a university. Also, that the Initiation, Assessment and Acceptance phases accomplish their purposes. Both also agree that IAPPA methodology accomplishes its purpose of developing a good TQM Plan, and finally that IAPPA methodology is feasible of being adapted for its use in other sectors or industries beyond the Higher Education setting.

SME D. Sniezek (Figure 59) strongly agrees on items 4 and 5, which means the Preparation and Acceptance phases accomplish their purposes, whereas SME M. Vora (Figure 60) agrees on both cases.

This feedback from Total Quality Management experts confirm and validate the ability of the TQM Methodology to accomplish its overall purpose.

Subject Matter expert qualification Report: TQM Methodology

Name: Daniel E. Sniezek

Experience/Position/Background: Lockheed Martin Black Belt, ASQ Fellow, IEEE Senior ASQ Regional Director, SUNY Council, CASS and SEED Board of advisors, Have considerable experience in the field of continuous improvement (TQM, Lean, Six Sigma and others) I also advise colleges, Universities. _____

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | | Strongly agree | Agree | Disagree | Strongly disagree |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|----------|-------------------|
| 1 | Is the methodology developed good enough to produce a good quality improvement plan for a university, that will make it consistent with its mission. | 4X | 3 | 2 | 1 |
| 2 | The Initiation phase accomplishes its purpose of . | 4X | 3 | 2 | 1 |
| 3 | The Assessment phase accomplishes its purpose of . | 4X | 3 | 2 | 1 |
| 4 | The Analysis phase accomplishes its purpose of . | 4X | 3 | 2 | 1 |
| 5 | The Preparation phase accomplishes its purpose of . | 4X | 3 | 2 | 1 |
| 6 | The Acceptance phase accomplishes its purpose of . | 4X | 3 | 2 | 1 |
| 7 | IAPPA methodology accomplishes its purpose of developing a good TQM Plan. | 4X | 3 | 2 | 1 |
| 8 | IAPPA methodology is feasible to being adapted for its use in other sectors or industries, beyond Higher Education | 4X | 3 | 2 | 1 |

The Acceptance phase is a critical activity. If the culture of the university/college is not changed the improvement will not be maintained.

Figure 59: SME Daniel Sniezek response

Subject Matter expert qualification Report: TQM Methodology

Name: Dr. Manu K. Vora, MBA, ASQ CQE & Fellow

Experience/Position/Background: Chairman and President, Business Excellence, Inc.

17 ½ years with AT&T Bell Laboratories, Naperville, Illinois – Internal quality management consultant; 10 yr 9 mo with Business Excellence, Inc. – global quality management consulting.

Adjunct faculty at various Chicago area business schools – taught operations management, supply chain management, project management and management of information systems technology courses.

I have B.S., M.S. and Ph.D. in chemical engineering, MBA with marketing management.

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | | Strongly agree | Agree | Disagree | Strongly disagree |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|----------|-------------------|
| 1 | Is the methodology developed good enough to produce a good quality improvement plan for a university, that will make it consistent with its mission. | 4x | 3 | 2 | 1 |
| 2 | The Initiation phase accomplishes its purpose of . | 4x | 3 | 2 | 1 |
| 3 | The Assessment phase accomplishes its purpose of . | 4x | 3 | 2 | 1 |
| 4 | The Analysis phase accomplishes its purpose of . | 4 | 3x | 2 | 1 |
| 5 | The Preparation phase accomplishes its purpose of . | 4 | 3x | 2 | 1 |
| 6 | The Acceptance phase accomplishes its purpose of . | 4x | 3 | 2 | 1 |
| 7 | IAPPA methodology accomplishes its purpose of developing a good TQM Plan. | 4x | 3 | 2 | 1 |
| 8 | IAPPA methodology is feasible to being adapted for its use in other sectors or industries, beyond Higher Education | 4x | 3 | 2 | 1 |

To make the IAAPA methodology more robust, I would suggest incorporating key aspects of human resources in the methodology (employee engagement, motivation and development) plus use of project management tools such as Gantt Chart, PERT Chart, Resource allocation, Budget management, etc.

Figure 60: SME Manu Vora response

6.3.3 TQM Plan validation

For validating the TQM Plan a form was developed and subject matter experts (SME) were selected. The objective is to test the purpose and gather feedback from experts in the field of quality in Universities. Following is the four page form (Figures 61, 62, 63 and 64) that was submitted to the experts along with the TQM Plan sample. The selected experts are:

- Carlos Fosca: BS, Doctor, current Vicepresident, and former Director of Planning (including accreditation initiatives) of Pontificia Universidad Católica del Perú.
- Carmen Coloma: BA, Doctor, current Accreditation Coordinator and former Dean of the College of Education, of Pontificia Universidad Católica del Perú.

TQM Methodology for Universities:

Initiation-Assessment-Analysis-Preparation-Acceptance

(Flores-Molina, 2011)

Purpose of the Methodology: to develop a TQM Methodology for universities, which will lead to the preparation of a TQM Plan.

Scope of application: Universities

Description:

The proposed TQM methodology is developed, following a seven-step meta-methodology. The proposed methodology guides the user to develop a TQM plan in five sequential phases: initiation, assessment, analysis, preparation and acceptance. IAAPA stands for: initiation, assessment, analysis, preparation and acceptance, and is the name of the proposed TQM Methodology. Each one of the phases includes its purpose, deliverables, key activities and tools.

Figure 61: Page 1 Subject Matter Expert TQM Plan Form

| | INITIATION | ASSESSMENT | ANALYSIS | PREPARATION | ACCEPTANCE |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PURPOSE: | To have information from University and preliminary agreement of scope, goals and stakeholders for TQM Plan. | To identify the Quality Dimensions and baseline and evaluate state of the art in quality. | To study and verify the causes of the current quality levels and select the significant areas for improvement. | To prepare the final draft of TQM Plan including selection of improvement projects, roles and responsibilities. | To communicate, gather feedback and obtain acceptance and commitment from faculty members and key participants, and written authorization from University CEO. |
| DESCRIPTION: | <ol style="list-style-type: none"> University profile, its context and strategic intent. University identifies the community to which the services are aimed to, stakeholders. University definition of quality in education and quality in research. Proof of the need why improve. Drivers for improvement. | <ol style="list-style-type: none"> Understand the current state of the quality of university education and research. Measure the current state of the quality of the university. Define what level of quality the university aims to achieve as well as its benefits. | <ol style="list-style-type: none"> Analyze the causes of the current status of quality, identifying the processes involved and their roles. Define Key Areas for Quality Improvement. | <ol style="list-style-type: none"> Update TQM Plan Charter Define and Develop improvement projects (QIP) associated with each KAQI in a program. Define roles and responsibilities Document TQM Plan | <ol style="list-style-type: none"> Communicate properly the TQM Plan to involve the university community. Obtain authorization from the authority to advance to TQM Plan implementation and have collective acceptance to ensure success. |
| KEY ACTIVITIES: | <ol style="list-style-type: none"> Collect state of the art information of the university. Document and update its strategic list. Create and validate the stakeholder map. Develop and update quality definitions. Prepare the first draft of TQM Plan Charter (including proof of need). | <ol style="list-style-type: none"> Validate QD and describe the state of the art. If applicable, define a QD problem statement. Assess the state of the art in each QD: H, M, L. Build the proposed To-Be situation in each QD. Identify the process associated with each QD, including inputs, outputs and process factors. | <ol style="list-style-type: none"> For each QD, analyze the process flow and generate ideas to explain potential causes of undesired as-is situation. For each QD, select the main possible root cause. Update problem statement for each QD. Identify KAQI by prioritizing QD. | <ol style="list-style-type: none"> Update and validate TQM Plan Charter. Devise QIP (including QIP charter) for each KAQI. Prepare the final document of the TQM Plan. | <ol style="list-style-type: none"> Create communication plan, selecting by actors for feedback. Communicate TQM plan and ask for feedback. Review and update TQM plan with feedback collected including proof of the need statement. Obtain commitment from Top Management and key actors. Obtain written authorization for TQM Plan implementation. |
| DELIVERABLES: | <ol style="list-style-type: none"> Profile documentation: Mission, Vision, Values, Services provided, stakeholder focus, governance system, faculty and staff, key resources, success indicators. Strategic intent. Stakeholder map. Quality definitions in education and research. TQM Plan charter (problem statement, quality goal, scope, timeline, roles and responsibilities) | <ol style="list-style-type: none"> Quality Dimensions document. Gap study: Baseline As-is and To-Be. Measurement in each Quality Dimension Measure (High, Medium, Low) Maps of processes associated with QD | <ol style="list-style-type: none"> SIPOC analysis. Documentation of the possible causes of quality problems. QD problem statement updated. List of Key QD with priority (QPN). Define Key Areas for Quality Improvement (KAQI). | <ol style="list-style-type: none"> TQM Plan charter updated document TQM Plan document | <ol style="list-style-type: none"> TQM Plan Communication Plan. Feedback document TQM plan updated and final document TQM Plan authorized. |
| TOOLS: | <ol style="list-style-type: none"> Interview. Workshop (SI). Stakeholder mapping. Survey/Brainstorming. TQM Plan Charter template (including proof of the need statement). | <ol style="list-style-type: none"> QD Template and validation workshop / Interview state-of-the-art Scoring template. To-Be Workshop. SIPOC development. | <ol style="list-style-type: none"> Brainstorming + SIPOC Analysis. C&E matrix. Problem statement TQM Plan template. Significance QPN matrix. | <ol style="list-style-type: none"> TQM Plan charter template / update workshop. Project selection (including Project Charter) template. TQM Plan template. | <ol style="list-style-type: none"> TQM Plan communication template. Stakeholder dialogue. TQM Plan template (updated). TQM Plan workshop program and engagement plan. |

Figure 62: Page 2 Subject Matter Expert TQM Plan Form

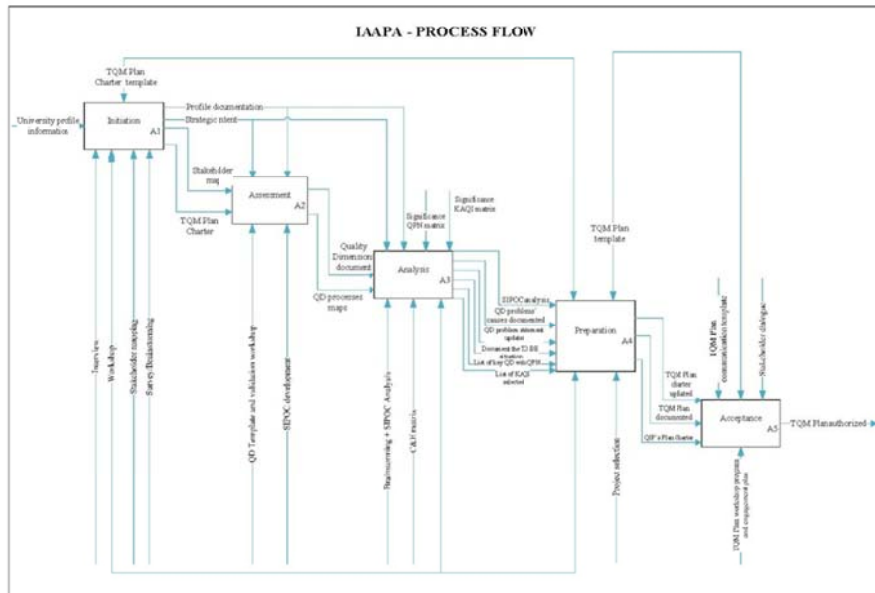


Figure 63: Page 3 Subject Matter Expert TQM Plan Form

Subject Matter expert qualification report: TQM Plan

Name: _____

Experience/Position/Background: _____

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | | Strongly agree | Agree | Disagree | Strongly disagree |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|----------|----------------------|
| 1 | IAPPA methodology accomplishes its purpose of developing a TQM Plan. | 4 | 3 | 2 | 1 |
| 2 | The TQM Plan developed will provide a good Plan for improving university quality. | 4 | 3 | 2 | 1 |
| 3 | The TQM Plan once implemented, is very likely to improve university quality. | 4 | 3 | 2 | 1 |
| 4 | The TQM Plan will initiate Total Quality Management in the university that implements it. | 4 | 3 | 2 | 1 |
| 5 | The use of TQM Methodology for developing TQM Plan will lead to a structured, organized and systemic organizational quality improvement effort. | 4 | 3 | 2 | 1 |

Figure 64: Page 4 Subject Matter Expert TQM Plan Form

6.3.4 TQM Plan Subject Matter Expert Surveys

Both experts strongly agree with items 2 and 5, and agree on item 3. It means that they strongly agree that the TQM Plan developed will provide a good Plan for improving university quality, and that the use of the TQM Methodology for developing TQM Plan will lead to a structured, organized and systemic organizational quality improvement effort. Also, both agree that the TQM Plan once implemented, is very likely to improve university quality.

SME C. Fosca (Figure 65) agrees with items 1 and 4, which means that IAAPA methodology accomplishes its purpose of developing a TQM Plan, and that the TQM Plan will initiate TQM in the university that implements it.

SME C. Coloma (Figure 66) strongly agrees on both cases of items 1 and 4.

This feedback from Quality in Education experts confirm and validate the ability of the TQM Methodology and TQM Plan to accomplish its overall purpose.

Subject Matter expert qualification report: TQM Plan

Name: Carlos Fosca Pastor
Experience/Position/Background: Vicerector Administrativo

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | Strongly agree | Agree | Disagree | Strongly disagree |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|----------|-------------------|
| 1 IAPPA methodology accomplishes its purpose of developing a TQM Plan. | 4 | 3 | 2 | 1 |
| 2 The TQM Plan developed will provide a good Plan for improving university quality. | 4 | 3 | 2 | 1 |
| 3 The TQM Plan once implemented, is very likely to improve university quality. | 4 | 3 | 2 | 1 |
| 4 The TQM Plan will initiate Total Quality Management in the university that implements it. | 4 | 3 | 2 | 1 |
| 5 The use of TQM Methodology for developing TQM Plan will lead to a structured, organized and systemic organizational quality improvement effort. | 4 | 3 | 2 | 1 |



Figure 65: SME Carlos Fosca response

Subject Matter expert qualification report: TQM Plan

Name: Parmen R. Coloma

Experience/Position/Background: Coordinadora de Auditoría de la Facultad de Educación, ex decana de la Facultad

Thank you for completing this form. Please circle your responses on a scale of 4 to 1

| | | Strongly agree | Agree | Disagree | Strongly disagree |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------|-------|----------|-------------------|
| 1 | IAPPA methodology accomplishes its purpose of developing a TQM Plan. | (4) | 3 | 2 | 1 |
| 2 | The TQM Plan developed will provide a good Plan for improving university quality. | (4) | 3 | 2 | 1 |
| 3 | The TQM Plan once implemented, is very likely to improve university quality. | 4 | (5) | 2 | 1 |
| 4 | The TQM Plan will initiate Total Quality Management in the university that implements it. | (4) | 3 | 2 | 1 |
| 5 | The use of TQM Methodology for developing TQM Plan will lead to a structured, organized and systemic organizational quality improvement effort. | (4) | 3 | 2 | 1 |

Figure 66: SME Carmen Coloma response

7 CONCLUSIONS AND FUTURE WORK

7.1 Summary

This research aims to develop a TQM methodology for universities to generate a TQM plan in a systematic and efficient manner. There exists no such methodology in the public domain, though models exist for quality improvement. These models do not provide a methodology to facilitate the TQM plan development process. There are also best practices available in each industry, yet they themselves do not help to generate a good TQM plan. The need for a TQM Methodology is significant for universities, as they constantly need to meet the accreditation bodies' and stakeholders' expectation for continuous improvement. In addition, their improvement has a direct impact on the quality of the society.

A seven-step methodology is applied to development of the methodology, which is then applied to a base university to develop a TQM Plan for the university. The selected meta-methodology provides a guideline a structured, progressive, and orderly development of the proposed methodology in a step by step manner, gradually leading the developer from review of the goals to be accomplished, the implications of each stage, and problems to be solved toward the final design of the methodology. One key aspect of the process is the analysis conducted with third parties and stakeholders in order to validate the goals to be achieved. The seven-step meta-methodology helps to ensure the relevance and adjustment to the purpose of the TQM Methodology.

The proposed TQM Methodology consists of five stages in sequence. They are: initiation, assessment, analysis, preparation and acceptance. Each of them has a purpose, a procedure of key activities, deliverables and tools used. It is operational for university users to follow and derive at a TQM Plan. The proposed methodology is limited to the TQM planning stage. It is not intend for the execution stage of TQM implementation. The TQM Plan is meant to bring progress in the university that implements it. However, the progress made is supposed to be continuous, incremental improvement as TQM implies. It helps to better align efforts with its mission and addresses stakeholder' expectation in a holistic manner. It does not prescribe a miracle to instantly transform a university of no name into a world-class institution

The proposed TQM Methodology is scoped to focus on the education and research functions of a university. Service domain is not included in this development. It can be included in the methodology by expanding the quality dimensions for the service domain of the university mission. The framework for the proposed TQM Methodology can be used as a basis to develop a TQM methodology for other industries. The main effort should be in the study of the characteristics of the target industry.

The main contribution of this study is the TQM Methodology, a tool for universities to generate a TQM plan in a systematic and efficient manner. It takes a holistic approach to the quality improvement problem of a university. The proposed TQM Methodology is applicable to any university regardless of its current quality levels or its emphasis on teaching or research. It helps to assure the quality of a TQM Plan, whilst making the process more efficient, better structured and cost effective.

7.2 Future research

This section summarizes potential research efforts which would further enhance the quality and application of the proposed TQM Methodology.

- Apply the proposed methodology to more universities to measure actual savings in cost and time for TQM efforts, and compare the quality of TQM plans.
- Refine the quality dimensions list and determine if new quality dimensions should be added to, with more feedback from more universities.
- Conduct a longitudinal study for the use of the proposed methodology for TQM planning and execution at a university to evaluate its quality over time.
- Separate subject universities into various types by its resource levels, missions, and teaching/research emphasis to see if there is a correlation for the use of the proposed methodology.
- Tailor the proposed methodology to focus its use on improvement efforts for accreditation (such as SACS and ABET), which usually focus on an evaluation of whether a university meets its minimum quality requirement.
- Develop templates that would serve for comparison on quality levels reached, quality indicators and performance indicators that would serve as a basis for comparison and future research on successful improvement initiatives and lessons learned.
- Focus the application of the proposed methodology at the college level in universities. Colleges are semi-autonomous units in a university. Their size and governance mechanism are complex enough to generate and execute their separate TQM plans.

- Expand the scope of analysis including services provided by universities such as continuous education initiatives, e-learning services provided, consultancy services, and others. Service is not included in this study. However, inclusion of the missing component will complement TQM plans for universities. To do so, additional quality dimensions need to be defined and added to the methodology.
- Extend the effort to include the implementation phase, beyond the TQM planning phase in a university setting.

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VITA

JOSE CARLOS FLORES-MOLINA

| | |
|------|-----------------------------------------------------------------------------------------------------------------|
| 1967 | Born, Lima, Perú |
| 1992 | B.Sc. Industrial Engineering Pontificia Universidad Católica del Perú Lima, Perú |
| 1997 | M.Sc. Quality Engineering University of Newcastle upon Tyne Newcastle upon Tyne, United Kingdom |
| 2008 | Professional Engineer Colegio de Ingenieros del Perú Lima, Perú |
| 2010 | Doctoral Candidate in Industrial and Systems Engineering Florida International University Miami, Florida. |

José Carlos Flores-Molina has been a full time professor at Pontificia Universidad Católica del Perú (PUCP), Department of Industrial Engineering since 1998. He is the Director of the Institute for Quality and is the Management Representative of PUCP for the quality management systems certified to ISO 9001:2008 and accredited to ISO 17025:2005 since 2002. He worked as an ISO 9001, ISO 17025 and ISO 65 Lead Assessor for the Peruvian National Accreditation Board (INDECOPI) from 1993 to 2000. He is a Lean Six Sigma Black Belt, having completed the George Group and University of Texas at Arlington training on 2007. He has served as an award examiner for the Peruvian National Quality Award based on the Baldrige Award in 1995 and 1996. He has completed ABET training as Program Evaluator on 2003 and was in charge of the accreditation evaluation visiting team of ABET and CEAB to PUCP in 2008 and 2009. He has also participated on the Pre-Applicant Workshop at SACS offices in Georgia in 2008 representing PUCP.

He is a Certified Quality Engineer, Certified Manager of Quality / Organizational Excellence, Certified Quality Auditor and Senior Member of the American Society for Quality (ASQ). He is also Chair of the Lancaster Medal of ASQ, which is presented to the individual who has been recognized for dedication and outstanding contribution to the International Fraternity of Quality Professionals.