

The Airplane Model: A New Business Reconfiguration - The Case of the Lebanese Health Care Institutions ¹

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Abstract

Taking into account that the global market challenges will create new business concepts that will be affected by ultimate technological advancements, this project highlights the importance of including financial KPI's and methodical development in the Total Quality Management system of an organization. Data was collected through a triangulation procedure built on a contemporary-structured literature review and qualitative-empirical methods (13 interviews) with a selected team of Engineers, strategic management experts, and certification managers in international standards. When reviewing our work within the context of the Lebanese Health Care Institutions during the recent pandemic situation (the managerial implications regarding the absence of financial KPI's) and methodical practices the results outlined a gap in the quality management control system. The originality of our work comes from the formulation of a new business model (the "Airplane Model") that crisscrosses the airline industry (using the airplane shape and structure) and the healthcare system (as a case study) and takes into consideration the technological advancements impact on practical decision-making processes and business continuity.

Key Words: Total Quality Management, Business Model, Healthcare Management, Technological Advancement, Financial Key Performance Indicators, Networking System.

Vocabulary

| | | |
|-----------|---|--|
| Products | - | Goods and services |
| PDCA | - | Deming Wheel (Plan – Do- Check –Act) |
| Take –Off | - | Start-up or Kick-off |
| Landing | - | Arriving to destination, or achieving purpose |
| TQMS | - | Total Quality Management System |
| QMS | - | Quality Management System |
| Pivot | - | Center of Gravity |
| Fuselage | - | The long hollow tube, or body of the aircraft. |

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| Wings | - | Foils of the aircraft |
| Empennage | - | The tail end of the aircraft |
| Power Plant | - | Engine and the propeller of the aircraft |
| Landing Gear | - | Used to help an aircraft take off and taxi, including wheels. |
| No-Go- Item | - | Non-conformity that prohibit the take-off |
| Go-Item | - | Non-conformity that allows the take-off |
| COPQ | - | Cost of poor Quality |
| ISO | - | International organization for standardization |

Introduction

- **General Outline**

Quality Management Systems are designed and developed to monitor, check, and improve the organization's products in order to deliver a customer value and achieve customer satisfaction. Although many theories treating both the financial impact and as well of the implementation of TQM in any organization were indeed developed, till date the financial KPI's and technology-related methods are not considered as a part of the TQMS (even within the context international standards). Considering ISO standards, 9001:2015 or any other standard that is related to the management system, one may notice that the financial part is omitted. Depending on the definition given by David Garvin from the Harvard Business School, Total Quality Management is “ [...] *the management of the whole to achieve the excellence of the products* ”; We understand that we can no longer exclude the Financial strategy and control from the Quality Management Wheel (PDCA) premeditated by Edward Deming or other theory. Although researchers discuss the importance of decreasing the cost of poor quality (COPQ), yet all international standards and norms related the Quality Management System indirectly exclude it and it was not listed under a specific clause.

- **Research Context**

Based on the current scholastic knowledge, the importance of any quality management system in an organization is indeed emphasized – however, the financial component is not always taken into consideration. Hence, we find ourselves in front of a new research dilemma: *How can a Business Model clarify the components of the organization within a TQM perspective in order to ensure its continuity?*

Literature Review

1. International Standards: a Holistic Approach

1.1 International Standards

1.1.1 General Overview

The term international standard has a variety of implications when it comes to conventional practice. In its firmest form, it can refer to an international regulation, procedure, or law communicated in a contract or agreement. The word “standard” (as is) is a commonly agreed “[...] way of doing something” (Tahir, 2016). A standard might equally refer to a usual “[...] trend in the marketplace” (Sharnovitz, 2005). Also, it is a “[...] technical specifications, rules, guidelines or even definitions or frames” (Tahir, 2016). Standards are usually set to make the business “life” easier and help increase the output, productivity, effectiveness, and efficiency of any repeated process in order to achieve a reliable and appropriate output.

Any international standard has two main characteristics (Sharnovitz, 2005): (1) The certification intent (“concern”) or the reason behind qualifying / obtaining / abiding (to) this particular certification / standard; (2) The institution must be international in the sense that it includes the contribution or input of business entities from different countries. By definition, the purpose of developing, improving, and applying standards is to ensure minimum act and presentation, meet security and protection necessities, make sure that the output or the process followed is reliable and ensure the reoccurrence of obtaining the same results that have set quality-related caliber (Omid, 2016).

1.1.2 Context and Scope

In order to enable the proficiency of any work-result related output within an organization it is essential to use consistent techniques and apply specified standards. When using the same norms, collaborating and exchanging data becomes much easier. Eventually, it means that we can generate more profit that will be later shared within a “[...] digital supply chain” (Tahir, 2016). Conversely, new products always face many challenges, because the related norms or standards are not yet set. The manufacturer or the provider (of products and / or services) will be advertising or marketing the derived output prior to setting the related norms. (Manfredi, 2016).

When we talk about old products, standards usually help in such case the manufacturers to reduce charges, anticipate technical requirements, upsurge productivity, innovate and revolutionize the outputs. On another note the worldwide norms context is essential when it comes to understanding and defining the scope of a management system. Within this context:

- The European Commission is aware and confident of the optimistic result of standards in sectors or zones, the formation of a unique Marketplace for goods and facilities.

- While In the UK, the usage and application of a norm offers a great marketing tool for businesses despite the size of the organization (whether small, medium, or large).

Standards are used to ameliorate the operational performance as well as to manage hazards or suspicious situations that an organization might encounter during the all-in-all procedural dynamic of the workflow (**Aung Ze Ya, 2016**). Standards are the assortment and gathering of good practices, written as a document or saved as data, well communicated, and approved by many experts of the same field. However, some experts perceived that standards are used to “[...] *de-skill things to a certain extent*” (**Yasseri, 2016**); such a stance views that the abider to a particular standard doesn’t necessarily need to be a professional in a specific domain.

When it comes to Standard implementation / injection, it does not solely refer to the application of specific norms within an organization or the existence of clear evidence that all necessary requirements (pre-requisites) are indeed applied. It also refers to the creation of synergized systems of pre-established principles validating a system’s mechanism and dynamics by overseeing the interrelated and connected elements effectively aiming to reach the organization’s goals, objectives, strategy, and mission. In addition, it generates profit with the minimum cost of redoing the same work all over again.

1.2 The Historical Buildup of International Management Standards

1.2.1 Early Beginning

The first management standard systems were created in the field of quality management, and specifically in the field of quality assurance. The origin of such systems goes back to the military field, which is not surprising considering the Business Strategies were heavily influenced by such a domain (e.g. project management, strategies, business modeling, decision making processes, etc.). In the 1950s, the U.S. Department of Defense needed to achieve a consistency of their produced output (that was either produced, purchased or contracted). The goal was to reduce their dependency on other organizations. Accordingly, they initiated auditing and inspection teams to insure a particular level of quality regarding the produced output. Such norms and procedures were for special segments and specified scope of activity and were firmly subjected to various controlling and supervising processes and internal auditing within the context of their own set-quality system (**Liu, 2013**).

The history of management standards started in the early 1900’s when Federick Taylor and Lilian Gilbreth were the first to analyze the operation of manufacturing industries and used the results to ameliorate and progress the work productivity (**Foster, 2012**).

In 1920’s Walter Shewhart recognized two classes of inequality which he called “[...] *assignable-cause and chance-cause variation*”. In 1930’s Dodge and Roming introduce “[...] *acceptance*

sampling”, and in 1940’s the armed norms introduced and led to what we call an evolution in quality practice worldwide (**Foster, 2012**).

1.2.2 Turning point(s)

During the post-WWII period, the Japanese had to import their raw materials in order to produce their local products and then ship them overseas in order to expand their exports all across the world. However, Japanese products were considered to have poor quality stigma in post-war Japan. Japanese manufacturers had to improve the quality of their output. Within this context, Deming and Juran went to Japan to contribute in the rebuilding of the Japanese economy through quality management procedures (**Foster, 2012**):

- The Japanese brought in Joseph Juran to teach them about quality and how to structure details plans that aimed to achieve the quality caliber that should be perceived as mandatory.
- Edward Deming was in Japan at that time and he used statistical approaches associated with the control charts made by Stewart.

One of the turning points in standardization was introducing the concept of renewing and republishing of a new standard (**AFNOR, 2015**). Juran also introduced the Pareto Law or the “[...] 80/20 rule that was created by the economist Vilfredo Pareto” (**White plains, 1968**). The consecutive improvement of different conceptual work frames and the improvement of its applications and practices led to the current definition of standardization. Another turning point in standardization was the initiation of a worldwide institution that took place in Geneva 1943 (**ISO, 2020**). “[...] in 1987, ISO publishes its first quality management standard” (**ISO, 2010**).

Standards in the ISO 9000 family have gone on to become some of the most well-known, needed and best-selling norms worldwide. Since the beginning, ISO has published monthly information about its technical committees, the standards published and administrative changes to the organization and its members, as well as the ISO Journal starting in May 1952 (**General Assemble, 1955**).

1.2.3 Certification Bodies & Certification Criteria

If we want to define the word certification, it is the validation of conformance and compliance. In most cases, requirements or criteria have been stated in standards as clauses, which “[...] include international ISO, European EN, and national SFS standards” (**Finas, 2016**). Either the management system, product or process, or personnel can be certified by a certification body (e.g. management systems about quality, environmental, occupational health, and data security system). The duty of the certification body is to evaluate whether the audited application of a certain norm, product, or personnel are in conformance with the specified standard. Assessment methods vary between a certification body and another even between an auditor and another. It

includes evaluation, testing, and inspecting gathered information from the practical operations based on documents and a written or competence-based qualification in the case of personnel certification. Once the management system as a whole demonstrates its validation and compliance to the requirements of the standards, then the certification body issues a certificate (IAF, 2020).

The issued certification is valid for a specific period of time after which recertification can be performed usually and it is limited to three (03) consecutive years. The first year is considered as certificated, the next two years are subjected to surveillance auditing, where the company is given a chance to improve and maintain its system in order to keep the certification. Getting a certification is a procedure that is done depending on the client's request, and sometimes it is used to demonstrate that the certified output fulfills the requirements imposed on it. In addition, a certification can be used to show the organization's compliance to the legal requirements, including European or other regulations. However, accredited certification bodies are considered as third party auditors independent of the target of certification and they must have the capability, ability, and skills identified in the standards. In other words, any certification body's role is to issue, review, renew, and withdraw certifications on the basis of a certification appliance and approved norms. This requires the certification body to determine and set up certification procedures, including "[...] procedures for monitoring, reviewing, handling complaints, and withdrawal as well as to present for the purpose of accreditation certification criteria to determine the rules under which certifications, seals, or marks are issued" (Afnor, 2015).

Granting a certification is done once the implemented system is in compliance with the standard requirements (Jelinek, 2018). The features of a qualified or certified institution includes many pre-requisites in terms of norms and criteria; the implemented system should be suitable for the production processes and operations' procedures as adopted by the same organization where all the requirements and criteria are set for all the products and services. Moreover, such mechanisms should be monitored and well controlled on continuous basis. The institution takes into consideration customers' requirements and expectations along with the operational part of its system. Inspection auditing sessions will take place as planned by higher management and the communication of results should be both written and recorded. It should also be mentioned that the authorization of certification is done to assess both the management system and proficiency of operations. On another note the aim of the certification process is to audit the degree to which the requirements of the management system are (were) indeed met. An organization carrying out certifications can also be accredited as it demonstrates the competence of certification. However, "[...] certification alone does not demonstrate that an organization is able to provide reliable results or products, since certification standards do not include requirements for technical competence" (Harjuoja, 2016).

2. Total Quality Management System

2.1 Total Quality Management

A Total Quality Management system is a well-defined set of processes that linked together towards achieving a well-networked system that can achieve organizational goals (specifically operational and financial ones) (Miller, 1996). It is essentially a technique of forming and relating the whole business, every section, division or subdivision, every activity, every single worker at every level. Within this context, every party involved in business operations either directly or indirectly and who eventually affects one of the processes is contributing in the final output (Oakland, 1989).

The first assumption that people hold towards the notion of “total quality” is goodness, luxury, shininess, weight, etc.; thus, it would be appropriate to clarify such a concept. The word “Quality” means the value of things as people usually qualify products as good quality or bad quality. That being said, there is also “[...] *the brave new statement (quality of life) that we hear is a cliché because every person assumes that the speaker means exactly what he or she means by the phrase*” (Crosby, 1985). This is why quality is also defined as the “[...] *compliance to criteria set in any since norms are manageable*” (Miller, 1996).

The influence of Total Quality Control in the organization involves the administrative and technical execution of clients-oriented quality activities as a major concern and accountability of general management (Garvin, 1988). In addition, Deming’s 14 points focus heavily on taking several steps in order to transform the business culture to upkeep the quality system. He clarified this notion of including everyone in the organization in the process of upgrading and ameliorating the system, such concerns as “[...] *driving out fear, removing barriers and providing training*”. (Deming, 1986), (Miller, 1996). Other experts have supported this notion as it can be seen as looking at the second point of “Quality Vaccine” – the process by which management brings a new concept of application toward excellence to the organization (Crosby, 1989). Additionally, others have indeed supported the involvement of everyone in the organization and it was evidenced by the employment of a pyramid or triangle shaped model – placing the management at the top, the functional management in the middle and the individuals’ workers at the bottom by which a quality management approach was implemented (Juran, 1989).

2.2 The History of Quality Management

- The first signs of quality control in a management-related form can be traced back to the construction of the Great Pyramid of Giza. Scientists claim that the tools and dimensions used in building these pyramids were professionally done to such a high extent that there had to be a methodical system for ensuring their quality. Historians have also found Ancient-Egyptian manuscripts showing pictures of examiners or supervisors.

- A second clear sign of quality management was found in the Law of Hammurabi. “[...] According to Law of Hammurabi if a building falls into pieces and the owner gets killed because of this the builder also shall be killed and if one of the owner’s children is killed, one of the builder’s children shall be killed.” The idea behind this philosophy was to create a law regarding employment, product legality and quality insurance and assurance of the built-up or what we call now an output. In addition, the Law of Hammurabi contained clauses regarding salaries, economics agreements, and contracts (**Edvardsson and Gustafsson, 1999**).
- A few hundred years after the Law of Hammurabi, Chou’s Constitution was founded in China which contained information and laws about how the government was managed.
 - Both Ancient Greek and The Roman Empire clearly used some kind of system to manage the quality (**Edvardsson and Gustafsson, 1999**); indeed the “[...] Years 500-1500 can be called *The Age of Craftsmanship*” (**Evans, 2008**). During that period the skilled craftsmen produced a wide variety of metal, steel, and leather products. A group full of craftsmen usually formed a special unit called guilds.
 - In Medieval Europe, guilds were the manufacturers and inspectors on quality. Skills and experiences were shared in the “[...] *master-apprentice base*” – meaning that the skillful employees trained the beginner to produce quality output (**Evans and Lindsay, 2008**).

The next important milestone in the history of quality was the Industrial Revolution. In the 1798 American Thomas Jefferson created the theory of substitutable part in the industrial field to America. The concept was originally founded by Frenchman Honoré LeBlanc. The concept worked very well in France where the master-apprentice approach was still in control but when the concept was set up in America, it did not work. The most important lesson from the manufacturing failure was the concept of variation. Although the muskets had interchangeable parts, they needed to be almost identical in order to fit (**Evans, 2008**).

In the early 1900s the United States distinguished themselves more from other countries, and Frederick W. Taylor develop a new manufacturing technique and organization principles or values. Taylor’s beliefs also called Taylorism, concentrated on increasing the output without increasing employment cost (**Evans and Lindsay, 2008**). The idea behind Taylorism was to divide the forecasting jobs and production. Supervisors were accountable for quality control. Failed and faulty products were simply argued. As times went by, companies began to assign a specific group to assure the quality of output. The group was detached from the production unit. The creator of the modern production line system, Henry Ford, had also a huge influence regarding the creation of system of quality. Ford introduced the balanced assembly line which consisted of workstations with different tasks.

The early XXth century marked the birth of process thinking. The first big influence in the development of quality was Western Electric employer named Walter Shewhart. In his work, Shewhart emphasizes continuous monitoring for the process based on numerical figures and analysis. Statistics were a vital creation in order to avoid disparity. Shewhart's goal was to control every variation by examining and studying the process, knowing and identifying the root source, and removing it from the course. He was the first to establish a simple quality improvement wheel with three stages; requirement, manufacturing, and monitoring/inspection. The United States military forces started to use Shewhart's invention, statistical process control, during WWII. In order to save the military level of power, all their tools including their guns and bullets need to be identical so it can be interchangeable. US Army started to require its suppliers to use "[...] SPC (*statistical process control*) to assure the quality" (Evans and Lindsay, 2008).

During the war, the US Army created the obligation which all the materials had to meet. All standards related to military actions were first published and communicated. After WWII, the United States was the leading country in rebuilding post-war Japan. In 1945, General Douglas MacArthur was named as a leader of political, social, and economic restructuring and rebuilding in Japan (USDS, 2013). General MacArthur selected Joseph Juran and Walter Deming to work on and support the reconstruction of the country (Evans and Lindsay, 2008). Juran and Deming would later emerge as arguably the two most influential persons in the development of the concept of 'Quality'.

The year 1946 was a milestone year for quality-based organizations as three major organizations were founded: "[...] *American Society for Quality (originally named American Society for Quality Control, changed in 1997), International Organization for Standardization and the Japanese Union for Scientist and Engineering. American Society for Quality (ASQ) was founded at the end of the Second World War when US experts wanted to pursue ways to continue improving quality*" (ASQ, 2013); To explain things in details:

- The International Organization for Standardization (ISO) was founded in London when representatives from 25 countries gathered at the Institute of Civil Engineers in London, UK, and decided to create a 109 organization to facilitate the international coordination and unification of industrial standards (ISO, 2013b).
- Union of Japanese Scientists and Engineers (JUSE) was founded to promote methodical study or research needed for the progression and improvement of science and technology, whereupon to contribute to the improvement of both societal and operational (JUSE, 2013).

The 1950s and 1960 cemented what is currently known as "the American way of life" and "Consumerism" in the United States. American consumers wanted to buy American products and factories were focused on quantity over quality. While the United States was heavily

concentrated on producing in order to cope with consumers' needs, Japan was concentrating on quality. Joseph Juran was fascinated by the quality control systems and his efforts in Japan played a major role in the country's quality growth and expansion of its exports. The most distinguished and prominent release of Dr. Juran was his book *Quality Control Handbook* (ASQ, 2013).

At the same time another quality consultant, Walter Deming was making his marks on Japanese manufacturing. Deming was interested in Shewhart's statistical techniques and he later published two major quality inventions: (1) Deming's 14 points for management which is still a field of study in today's business; and (2) the Deming Wheel which consists of four steps – where the idea is to ensure continuous quality improvement (ASQ, 2013).

This particular period of the decade can be viewed as an era of many quality creativities. Japanese Doctor Kaoro Ishikawa lectured the lower-level employees about the usage of simple statistical methods. Dr. Ishikawa designed several quality tools that are used even today. They include the “[...] *cause-and-effect diagram (also called Ishikawa diagram), the Seven Quality tools, and Quality Circles.*” The conclusion of those methods was usable by low-skilled employees (Edvardsson and Gustafsson, 1999).

In the late 1970s quality management guru Philip Crosby published his world-known book, *Quality is Free* (ASQ, 2013). Crosby earned the Guru title because of his work in business and innovations. He influenced the improvement methods used by organizations to ameliorate their financial status. 1980s was another remarkable milestone in the development of quality. The United States realized the threat Japan forced because of the higher quality of products and in manufacturing. In 1987 US government named October as National Quality Month and created the Malcolm Baldrige National Quality Award (Evans, 2008). In the same year, the International Organization for Standardization established an ISO 9000 standard (ISO, 2013).

The 1990s saw two notable quality initiatives. In 1994, International Organization for Standardization updated its ISO 9000 quality standard to ISO 9000:1994 (ISO, 2013). In 1995, American company General Electric and its CEO Jack Welch developed their quality initiative called Six Sigma. The purpose of Six Sigma is to minimize the failure rate greater than “[...] *3.4 defects per million*” opportunities. *That level of quality is called Six Sigma, hence the name*” (GE, 2013). Another remarkable quality initiative invented in the 1990s was called Lean Manufacturing. Powered by Toyota's manufacturing Lean Manufacturing emphasizes the reduction of waste during manufacturing and thus making the system very efficient (Shaffie and Shahbazi, 2013). The 2000s saw three updates to the ISO 9000 standard by the International Organization for Standardization in 2000, 2008, and 2015 (ISO, 2015), (LIU, 2013).

2.3 Development of useful methods and theories

2.3.1 Taylorism

Changing Roles for Workers and Managers As opposed to some harsh criticism against Taylorism, Taylor attempted to increase the advantages and benefits of both labors and organization owners and achieve good workplace environment (**Corbacioglu, 2016**). In his book *Principles of Scientific Management*, Taylor rejected the traditional work practices in which workers decided the volume and method of doing any task. According to the traditional system, it was workers who decide the amount of output therefore the profitability of the firm. The traditional system resulted in soldiering of workers and significantly limited the effectiveness, efficiency, and productivity. Taylor Suggested new roles for the managers and workers as follows: Systematic approach of job tasks; planned hiring system including training, and career development of workers; beneficial interaction between managers and labors for the application of scientific disciplines regarding the job to be performed; A reasonable assignment dedication and circulation of workload between labors and managers through new roles defined by Taylorism (**Corbacioglu, 2016**).

2.3.2 Deming's Theory

Total Quality Management rests upon fourteen points of management he identified, the system of profound knowledge, and the Shewhart Cycle (Plan-Do-Check-Act). He is known for his ratio – Quality is equal to the result of work efforts over the total costs. If a company is to focus on costs, the problem is that costs rise while quality deteriorates. Deming's system of profound knowledge consists of the following four points; “[...] *System Appreciation*” – an understanding of the way that the company's processes and systems work, “[...] *Variation Knowledge*” – an understanding of the variation occurring and the causes of the variation “[...] *Knowledge Theory*” – the understanding of what can be known and the “[...] *Psychology Knowledge*” – the understanding of human nature (**Ronda Bowen; 2011**).

By being aware of the different types of knowledge associated with an organization, then quality can be broached as a topic. Quality involves alteration of processes using knowledge. The fourteen points of Deming's theory of total quality management are as follows: Create devotion of purpose, apply the new theory, stop dependencies on mass reviews and check-ups, don't assign business based on the price, aim for constant production and service development, bring in leading-edge on the job training, implement cutting-edge methods for leadership abolish fear from the company, decompose sectional obstacles, avoid mass production goals, stay ahead of complicated norms, give value for expertise and technical labor, ensure everyone is skilled and competent, make sure the management is committed to maintaining the system structured by the previous thirteen points (**Ronda Bowen; 2011**).

Plan-Do-Check-Act (PDCA) is a cycle created for continuous improvement. In the planning phase, objectives and actions are outlined. Then, you do your actions and implement the process improvements. Next, you check to ensure quality against the original. Finally, acting requires that

you determine where changes need to occur for continued improvement before returning to the planning phase.

2.3.3 Crosby's Theory

Philip Crosby is another expert credited with starting the TQM movement. His works were much similar to those Deming: if one spends money on quality, it is money that is well spent. Crosby work was based on four absolutes of quality management and his own list of fourteen steps to quality improvement. He defined “[... *quality as adherence to requirements; Prevention is the best way to ensure quality; Zero Defects (mistakes) is the performance standard for quality; Quality is measured by the price of nonconformity*”. The fourteen steps to continuous quality improvement, for Crosby, are: Achieve management total guarantee of maintaining the system; Form a department specialized in developing the quality; make analysis for the advancement achieved; identify the benefits of improving the quality and relate it to gains; develop supervisors skills and abilities; Inspire labors to fix faults and imperfections of machines and keep records of this; Create a committee that work to achieve zero-non conformity; Ensure that labors and managers comprehend the phases toward achieving quality; Prove your organization's commitment by announcing a day to celebrate zero defects; objectives are set and followed up on timely basis; Identify the real cause on non-conformity and eliminate them from the system; Initiate incentives to motivate employees; Initiate a quality committee and assign meetings regularly; Repeat from step one (Bell, 2007; Effah,2018).

2.3.4 Joseph Juran's Theory

Joseph Juran is responsible for what has become known as the Quality Trilogy. The quality trilogy is made up of quality planning, improvement, and control. If a quality improvement project is to be successful, then all quality improvement actions must be carefully planned out and controlled. Juran supposed there were ten steps to quality improvement. These steps are: A consciousness of the chances and openings and the need for system amelioration must be formed; Improvement objectives must be strong-minded; Institution team has to achieve the objectives set; Training is to be approved and budgeted; Prepare missions; Screen advancement; Identify performance; Report results; Improvements to be tracked with evidence; Re-do (Padilla, 2019).

2.3.5 The EFQM Framework

The European Foundation for Quality Management (EFQM) Model is based upon nine criteria for quality management. There are five enablers (criteria covering the basics of what a company does) and four results (criteria covering what a company achieves). The result is a model that refrains from prescribing any one methodology, but rather recognizes the diversity in quality management methodologies. The nine principles as defined by the EFQM Model are Attention to Results – communicate company's results with stakeholders; Concentrate on clients and end-users – Quality management leads to customer satisfaction; Devotion of Purpose, Idealistic Leadership; Process

and Facts form the Management Focus – Management breaks down everything into systems, processes, and facts for easy control; Apprenticeship and Encompassing Employees – Employees should receive professional development opportunities and be encouraged to remain involved in the company; Non-stop Learning culture – everyone should have the chance to learn on his or her job; Encouraging Partnerships – It is important to encourage partnerships that add value to the company’s better position; Social Responsibility of the organization – The company is a part of the whole society and should be accountable for its acts toward the environment and social responsibility (Nabitz, 2000).

2.3.6 Ishikawa’s Theory

Dr. Kaoru Isikawa is often known for his namesake diagram, but he also developed a theory of how companies should handle their quality improvement projects. Ishikawa took a look at quality from a human standpoint. He points out that there are seven basic tools for quality improvement. These tools are: Pareto Analysis – Pareto analysis helps to identify the big gap in a designed system; Cause and Effect Diagrams – Cause and effect diagrams help to know to the basic reason of the gap; Stratification – Interrelation of collected information; Checklists – Checklists identify the occurrence of non-conformity; Histograms – Histograms monitor variation; Scatter Charts – Scatter charts shows associations between different factors; Process Control Charts – A control chart emphasis on what discrepancies to center our focus upon. (Wong, 2011).

Business Modeling

3.1 Business Models

3.1.1 A general Definition

While it has become fashionable to discuss business models, there is no widely-adopted definition of the term. Twelve definitions are proposed in recognized journals, newspapers, and books from 1998 to 2002, coming from an extensive diversity viewpoint including e-business, strategy, technology, and information systems. It is clear that no single definition of the business model will satisfy the scholarly community – but it is equally clear that people with a wide range of backgrounds are indeed interested in the approach. That being said it is viewed that business model actions could be distributed into four separate groups: planning choices, the networking system, creating and capturing added value (VIVACE, 2006; That being said, the most appropriate definition: “[...] *A business model is a representation of a firm’s underlying core logic and strategic choices for creating and capturing value within a value network*” (Shafer et al, 2005).

3.1.2 Types and Categories of business Model

Experts, executives and researchers have all elaborated a thorough classification of business models where the following categories were defined (Gennaro Cuofano, 2020):

- **One-for-one business model:** This kind of model is a combination between profit and not-for-profit models;
- **Razor and blade revenue model:** when clients decide to be devoted for a company's output, then the organization will be able to introduce to the market allied accessories for a higher price;
- **Cash conversion cycle or cash machine model:** A company without profit won't be able for continuous business.
- **Peer-to-peer business model:** is based on creating value for corporate relationships for both demand and supply.

Multi-sided platform business model, the company functioning offers services to both sides; E-commerce marketplace business model: building up a website and e-commerce has become easier, doesn't request a particular cost for brick-and-mortar business, furthermore small enterprises make the joint venture and gain revenues from the marketplace (**Gennaro Cuofano, 2020**).

3.2 Business Model Implementation

3.2.1 Context

When Work environment change, the clear business models change along with them. Once the experience is grown and the function is clear, the output offered may not have the same outcome as when it was first entered into the market. Successful business model evolution builds on a company's essential strengths and finds better ways to satisfy its most important clients. They should be implemented with clarity over a defined time frame (**Devra Gartenstein, 2020**).

3.2.2 The Plan

A business model evolution should be planned not randomly using substitute outputs for inefficient previous ones. Any planning process should be done with care in order to address gaps and problems such as purchasing new machines or equipment. Strategists and quality experts should develop a change plan that takes into consideration every small detail towards decision making (**Devra Gartenstein, 2020**).

3.2.3 Bringing Staff on Board

Labors are your partners when deciding to implement and apply a new business model. They are aware of customer's needs, expectations, and points of view along with your current market situation and they have the skills and abilities in addition to their personal experience to add a valuable act and smooth the way of the transition period. If they succeed to implement the new business model as is and as planned, they might earn extra profits or benefits. In addition, they get

a high level of job security. To achieve this level of excellence you must keep your team updated as if they are your partners (**Devra Gartenstein, 2020**).

3.2.4 Reaching Out to Customers

Customers ensure a company's business continuity – thus a successful business model transition will definitely involve customers by clearly outlining the benefits that they may receive in return. By clearly communicating such these benefits, the organization has the opportunity to ameliorate its market reputation and gain the support of its clientele regarding its future products (**Devra Gartenstein, 2020**).

3.2.5 Incremental Change

Business model transition can be tricky if the company relies on a revenue stream from a product or service you plan to phase out. Although the income may arise later, however on short term it won't bring much profit because the business model transition can cause gaps and barriers especially in the first interim period. Thus, a slow change process may guarantee gradual benefits along with minimizing potential troubleshoot. (**Devra Gartenstein, 2020**).

Work Postulates

1. Research Mechanisms

1.1 Research Dilemma

Following on the cited above literature review, it is clear how theoreticians, field experts and academicians worked systematically on improving the previously drawn conceptual frameworks in order to ameliorate the quality management system. However, the application of theories was defined, explained, and communicated through standards and international organizations that adopted the most important and applicable parts of the theories into the international standard. Of course, all researchers link the effect of quality application and culture to the profitability of the company but yet there is no theory developed to link the objectives, goals, risks, opportunities, and threats to financial key performance indexes. Based on what was mentioned, we find ourselves in front of the following research dilemma: ***How can a Business Model clarify the components of the organization within a TQM perspective in order to ensure its continuity?***

The Following research interrogation actually derives several sub questions which we can highlight as follows:

- ***How can an organization set the criteria related to the usage of technological advancement?***

- *What can a business model add to the start-up organizations?*
- *How does / can a business model affect the current norms and standards?*

1.2 Research Paradigms

Our work on the cited above literature made possible the emergence of several research postulates as paradigms that we will try to review and study within the context of our empirical work. The following postulates may be viewed as the appropriate clarification and justification of our research questions and its derivative inquiries.

- A Business Model that crisscrosses KPI's, financial mechanisms and technological advancement along with the quality KPI's.
- The Genesis of a new Business Model that highlights a new business Frame work.

Such postulates will serve our research paradigms that will be studied in the context our research with regards to our empirical work.

Research Design, Methods and Methodology

1. Approaches

1.1 Methodology and Methods

1.1.1 Context

Our research began when we revised all the existing literature that treated the different norms and standards, along with the known conceptual frameworks elaborated by well-known management experts and academics. A gap can be highlighted within the application of the management system notions. The cited gap in the quality management systems and its related norms is omitting to connect quality KPI's to the financial ones. It is to be stressed that the implementation of the quality management system is not limited to a specific field or domain, and the accredited certification can be awarded in diverse businesses.

1.1.2 Epistemology

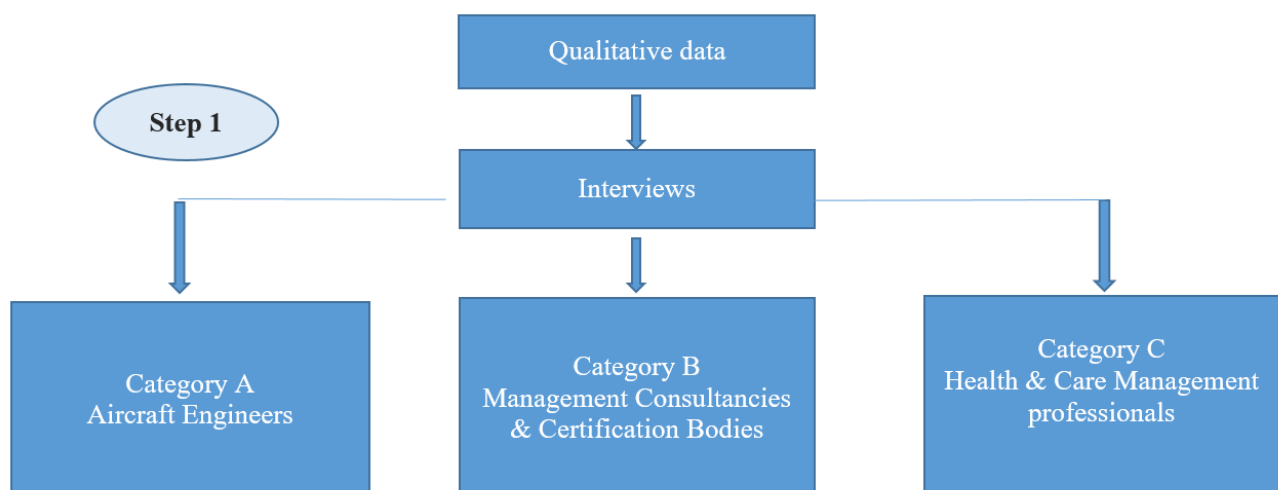
We have adopted the constructivism stance (**Haraké M-F., 2019**), and we found it is a major concern to create a new business model that will re-structure the organizational departments from a new perspective (**Miles, 1994**). As known the quality management system is useful and applicable in different types of administrations with different scope of activities whether corporate business, health care institutions, airline industry, restaurants and others; however this business model will originate a significant guide for the start-up businesses .

1.1.3 Method and Tools

To achieve our perceived objective we will use qualitative data method (interviews only at this stage) to conduct our research toward achieving a new business model as a result of this study. Since our research is grounded on the conceptual frame work related to the quality management system, we will use the deductive approach that is concerned on developing a hypothesis based on the previous theories (**Haraké, M-F., 2019**).

Therefore, when we chose to gather our data using qualitative method (**Miles, 1994**), we relied on knowledgeable and experienced experts from corporate, health care and airline business (**check figure 01, 02**). Therefore, we classified our interviewees in three categories; (1) Category A- Aircraft Engineers; (2) Category B- Management Consultancies & Certification Bodies; (3) Category C: Health & Care management professionals. (**Check Appendix 1- Interviewee Categories**)

Figure 01. Interviewees Categorization³

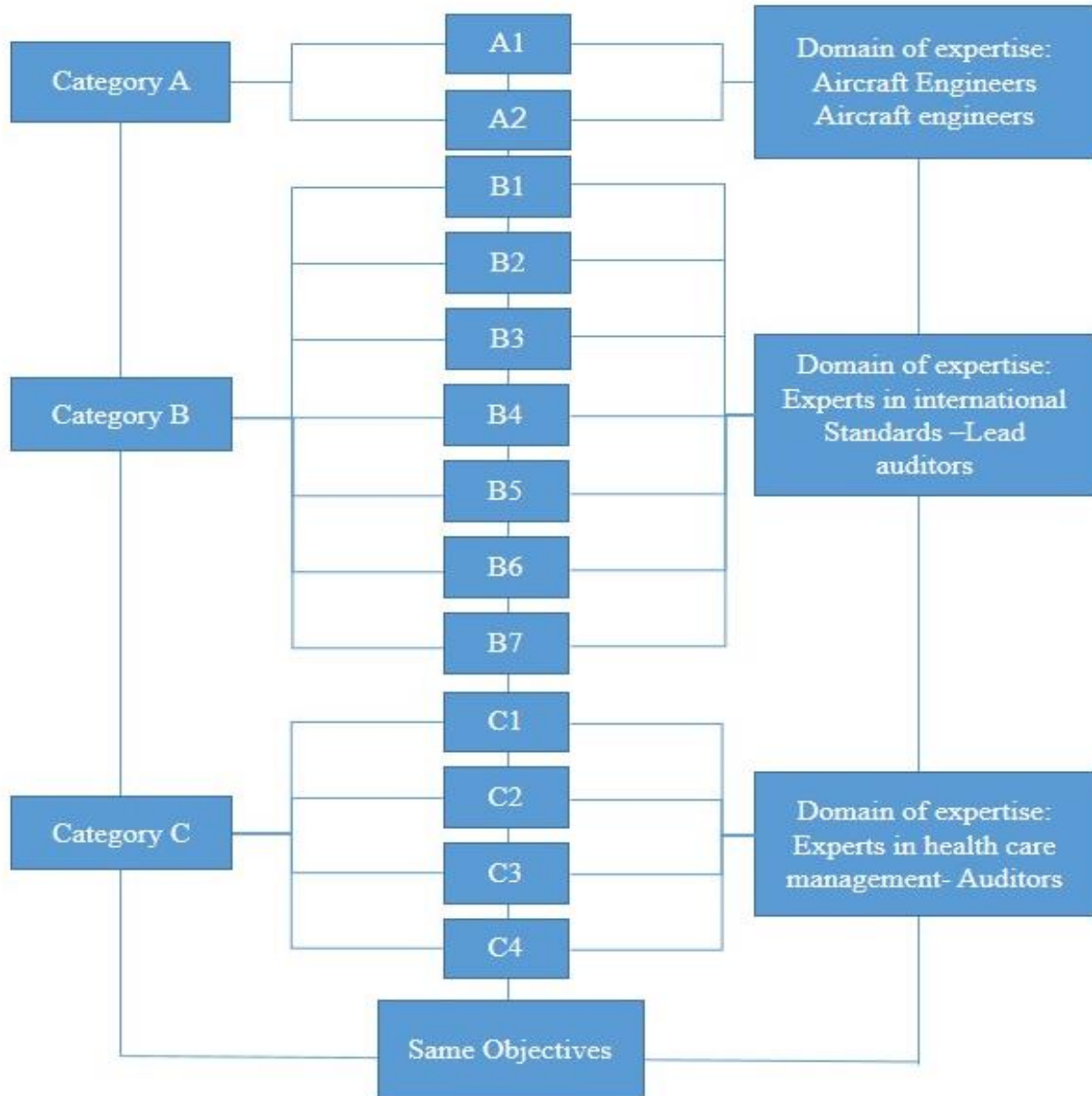


The Classification of the interviewees as detailed in (**Figure 01**), and in (**Figure 02**) was done based on their field of study and their profession. The common segment between all the experts is their experience and involvement in quality management system along with their deep knowledge in international norms and standards related to QMS. We prepared three different interview questions for each category (**Figure 03**), taking into consideration the same objectives and the same type of questions; direct, specific and structured and follow-up questions (Check **Appendix 2 – Interview Questions**).

³ Source – Author

²Source – Author

Figure 02. Interviewee Profile⁴



The below figure explains clearly the categorization done for our interviewees. It shows the number of interviewees in each categorization along with their domain of expertise.

Interviewee Profile

Figure 03. Interview Objectives⁵

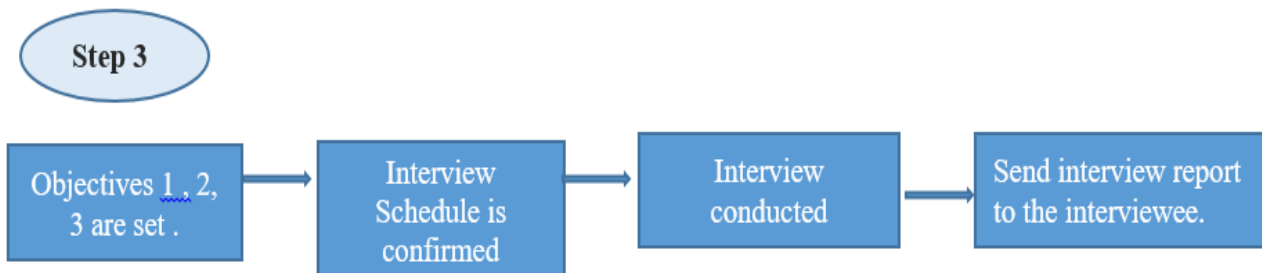
Step 2

| Interviewee Categories | Nb of questions | Objectives |
|--|------------------------|--|
| Category A Aircraft engineers and experts | 12 | <ol style="list-style-type: none"> 1. Ensure that the new business model is based on a valuable and strong frame. 2. Get feedback about the importance of Financial Kip's inclusion and on the business administration. 3. Get a clear feedback about the risk of delaying the inclusion of technological advancement. |
| Category B Business Management Experts | 10 | <ol style="list-style-type: none"> 1. Get a clear answer if the international standard for quality management system is enough to ensure the business continuity. 2. Get a feedback about the importance of financial KPI's. 3. Get an answer if the risk assessment plan prepared by the certified company's is satisfying. |
| Category C Health Care Management Experts | 10 | <ol style="list-style-type: none"> 1. Get a feedback about the difficulties that the health care is facing , and relate it directly to the poor quality of services caused by the poor financial situation 2. Get an answer about the importance of technological advancement in the health care field. 3. Get a feedback about the importance of financial KPI's |
| Type of questions : Direct , Specific, Structuring, Follow-up questions | | |

Consequently, we defined the interview analysis process, vertically and horizontally. We set a well-defined matrix to assess the response of the interviewee, and based on the positive and negative results we received, we built our new business model.

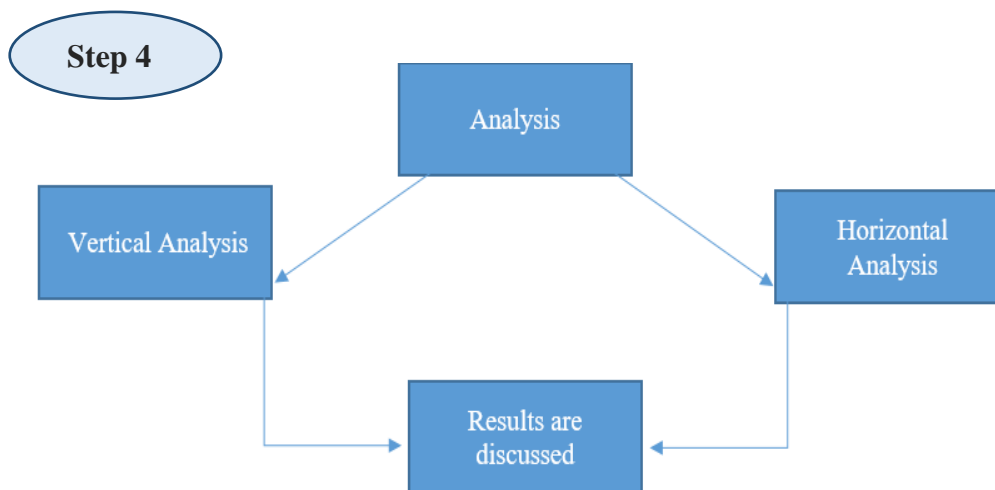
⁵ Source – Author

Figure 04. Interview Progression⁶



(N.B Interview outline is referenced as Appendix 3)

Figure 05. Analysis Process⁷



After conducting the interviews analysis, we will be able to explain the effect of the new business model and its added value on a short and a long run.

Interviews Analysis

1. Analysis Design

Analysis of the interviews is conducted in order to collect the answers of our interviewees who are experts in three different fields, thus we will direct a vertical analysis first divided by interviewee's categories then we will lead a horizontal analysis as an overview of results of the three groups.

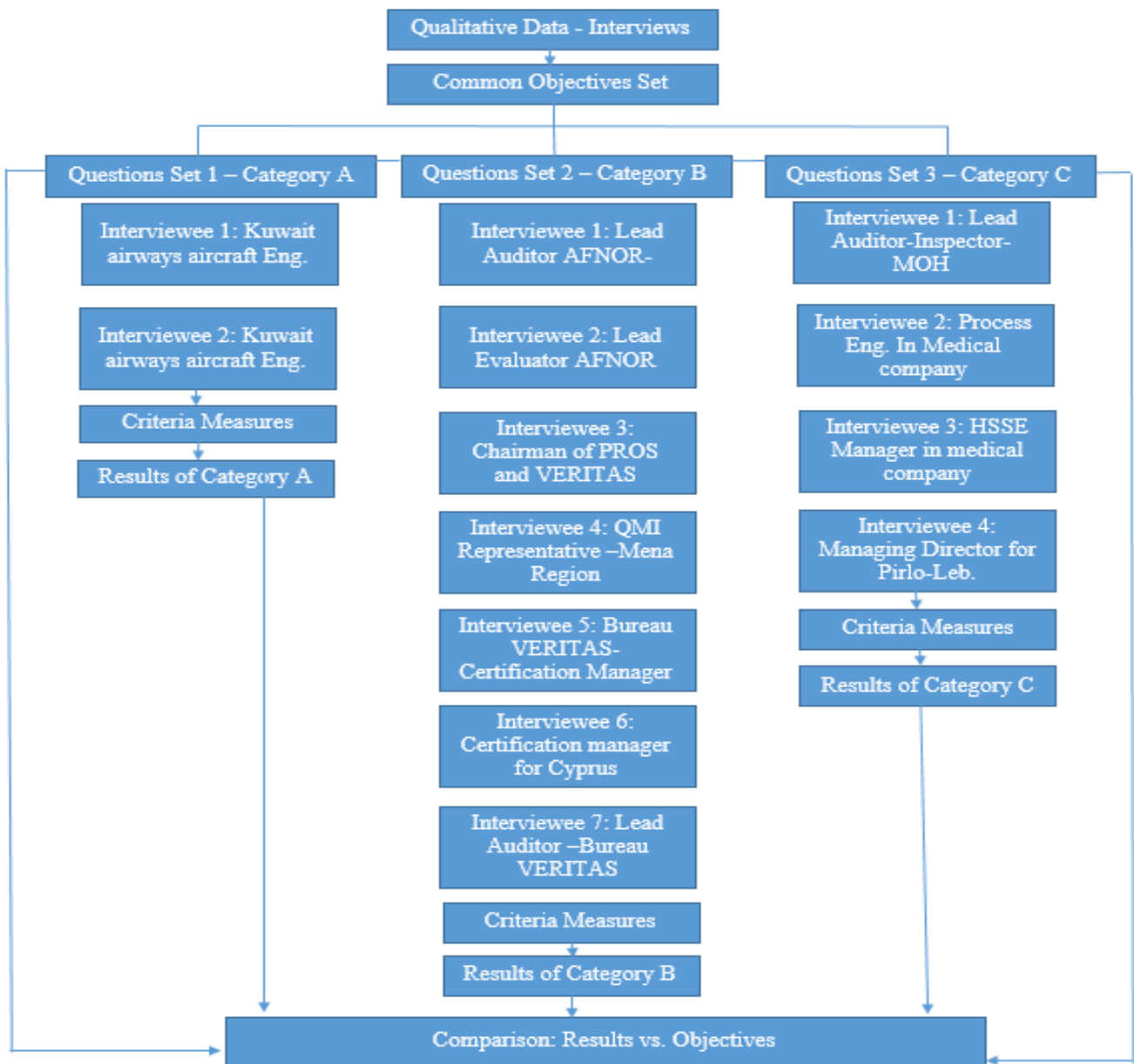
⁶ Source – Author

⁷ Source – Author

1.1. Vertical and Horizontal Analysis Plan

The below figure describes that we prepared a different set of questions to be discussed with each category of interviewees. Our aim is to achieve the three different objectives that we set before thus you will notice that most of our interviewees are management consultants, auditors, or certification managers for reputable certification bodies. Their qualification is a must to get accurate answers about the international normes and applied standards.

Figure 06. Analysis plan⁸



⁸ Source – Author

1.1.1. Exploration Analysis

The below is the vertical analysis done by category, we classified the questions into themes to clarify the results of the collected answers.

Table 01. Analysis Process - Category A⁹

| Question Theme - Category A | Analysis | Criteria |
|---|---|--|
| <p>Theme 1 – Main Component of an aircraft. (Appendix 2 – Category A- Question 1 – 2)</p> | <p>Answers received shows clearly that an aircraft is basically about two combined systems that include 5 main components: Wings and engines (power plant). Aerodynamic shape (fuselage, empennage), control surface (landing gear) of the aircraft.</p> | <p>-Answers of both interviewee must be similar giving the same exact components.</p> |
| <p>Theme 2 – Changes and amendments affects the profit. (Appendix 2 – Category A- Question 3-4-5-6)</p> | <p>During operation, unplanned incidents may occur, like the sudden drop or add of passenger’s number, or changes in the cargo shipments. This change affects the planned operational decisions, and it must be limited, otherwise it increases losses, and consequently decreases the company’s profit.</p> | <p>-Clear examples to be given and explained by both interviewees, based on facts, and experience.</p> |
| <p>Theme 3 – Importance of Technological advancement usage in daily operations. (Appendix 2 – Category A- Question 7-8-9-10-11-12)</p> | <p>Interviewee explained the challenges they encounter on daily basis and how the work manually to solve the operational concerns that delay the flights and affect the passenger’s connection flights, in addition to the enormous cost of compensation that the company pays. So we can relate the usage of technological advancements to the financial key performance indicators and quality of service, since the operational cost increases, and the consistency of providing a high quality of service becomes intermittent for a certain period of time. The example of de-icing machine and the application of the optical landing system were discussed with the interviewees as an example of technological advancement.</p> | <p>-Interviewees must explain the importance of technological usage based on daily operational work. -Interviewees must clarify what are the difficulties of a manual operation and they must explain how the technological usage can be an impeccable alternative to save time and money.</p> |

⁹ Source – Author

Results of interviews with Category A

We may conclude that both interviews with the aircraft engineers who have a vast knowledge and experience in the airline field gave rise to:

- 1- The importance of the 5 main components of an aircraft (Fuselage , wings, empennage, power plant and landing gear)
- 2- Explained the role of each fragment and how it constitutes a basic part of the whole aircraft.
- 3- Our interviewees explained the importance of the technological advancement usage and the difficulty to work manually.
- 4- Same results can be achieved based on manual work, however time consumption, safety risk, cost of work and rework are higher and cause loss to the organization and affects its business continuity on the long run.
- 5- Operational changes cannot be avoided all the time, but it must be monitored and controlled via financial key performance indicators to prevent losses.

The second vertical analysis for category B – Management experts and auditors.

Table 02. Analysis Process – Category B¹⁰

| Question Theme - Category B | Analysis | Criteria |
|---|---|---|
| <p>Theme 1- Current Worldwide management standard. (Appendix 2 – Category B- Question 1-2-3-4)</p> | <p>Answers of the interviewee’s shows clearly, that the current standard is made to be flexible and applicable by all type of businesses. The current standards doesn’t include directly the financial key performance indicator when measuring the quality system. Thus, when the current pandemic situation occurred, most companies are not able to survive and their business continuity is very challenging. Each consultant or auditor answered the four questions differently, but they agreed that financial measures affects directly the quality management. When we asked if the financial KPI is mentioned in the international standard and under which clause number, we got different answers. Then, it is not required by the book, and the certification of an organization doesn’t rely on the presence of the financial KPI’s.</p> | <p>-Answers of the interviewees must be similar giving the same exact clause number for financial KPI’s in case it was mentioned in the international standard, otherwise we can consider it not available.</p> |

¹⁰ Source – Author

| | | |
|---|--|--|
| <p>Theme 2 – Technological advancement effect on certification (Appendix 2 – Category B-Question 5-6-7)</p> | <p>As per the interviewee, the international standard does not oblige the management of an organization to use technological advancements, and for them it depends on the need of the organization and the scope of activity. However, two similar organizations with the same scope of activity, producing the same product can be ISO certified, while one organization works manually, and the other rely on technological advancement usage. Since, the financial KPI's are not mandatory linked to the quality objectives, risk assessment or controlling measures, then both organizations get certified.</p> | <p>-Interviewees agree that technological advancement usage does not stop the certification process, neither the absence of financial KPI's, although they all agree that financial situation affects the quality.</p> |
| <p>Theme 3 – Financial and technological implication on Quality (Appendix 2 – Category B-Question 8-9-10)</p> | <p>Interviewees agreed that management commitment to quality is very critical and highly important to maintain and improve a quality management system. One of the most important issues is commitment to provide the adequate and needed resources, and the needed financial capitals. They also gave examples of the minimum technological advancement, but from their own perspective as auditors and consultants, since there is no clause that state clearly what is the minimum that should be available and implemented for a company to get certified.</p> | <p>Getting different answers when talking about the same standard is an evidenced that there is no clause that includes financial KPI's and the accepted usage of technological advancement.</p> |

Results of interviews with Category B

We may conclude that all the interviews with the management experts, consultants and auditors shows the following:

- 1- There is no clause in the international standards specified for the quality management system that states clearly that financial KPI's should be set, clear, and linked the quality management system.
- 2- They agreed that financial situation of the company affects the quality management directly, since it affects the availability of resources.
- 3- The financial situation affects the management decision to invest in technological advancement usage.
- 4- Financial situation affects the employee's knowledge, trainings, and development.
- 5- Technological advancement usage is no longer a choice, especially after this pandemic situation, since the organizations that work manually, had to close for long periods, which affected its operation and profit.
- 6- Financial planning is not beneficial if it was not linked to the organization's objectives, risks, action plans.

The third vertical analysis for category C – Health care management experts.

Table 03. Analysis Process - Category C¹¹

| Question Theme - Category C | Analysis | Criteria |
|---|---|---|
| <p>Theme 1- The effect of the Lebanese MOH financial situation on the services and it's quality. (Appendix 2 – Category C- Question 1-2-3)</p> | <p>Answers of our interviewees were clearly stating that the Lebanese Ministry of health is a part of a whole system, and it is affected directly by the Lebanese financial crises even before the occurrence of Covid - 19.</p> <p>However, they also mentioned that the services provided were satisfactory when discussing usual diseases treatment. But the admitted that our MOH was not ready to handle a pandemic situation and this was caused due to the absence of stock pile, wrong planning, poor financial situation and limited availability for ventilators and personal protective equipment.</p> | <p>Should receive Similar answers since the MOH situation is well known.</p> |
| <p>Theme 2 – Importance of a new business model that relate Financial KPI's and technological advancement in health care institutions. (Appendix 2 – Category C- Question 4-5)</p> | <p>Our interviewees stated that it would be very important to link both financial KPI's and the technological advancement to the current system, since one the most common issues that our MOH face in Lebanon is the corruption. And since the applicable and used systems are not advanced, it is impossible to monitor and control the expenditure of capitals distributed to the hospitals. Thus, the ministry decided to put a limited amount for each hospital, knowing that the criteria set to decide what is the appropriate amount is also fake.</p> | <p>Answer should highlight the importance of financial KPI's and the benefits of an efficient management system.</p> |
| <p>Theme 3 – Communication planning, and deadly mistakes in the health care system and how it can be solved. (Appendix 2 – Category C- Question 6-7-8-9-10)</p> | <p>Communication shall be planned, controlled and monitored by the ministry of health. Our interviewees agreed that media was not showing responsibility toward our society, what they care for is to get advertisement profits. Nowadays spreading wrong information is considered as a weapon, especially in the health care industry. And it cost the nation a huge financial loss. They also replied that deadly mistakes are: unqualified auditors, absence of technological advancement, and absence of a system that link all the citizens' medical information to the MOH. Inadequate statistics are a result of the poor financial situation of our MOH.</p> | <p>Poor system in public hospitals.</p> <p>Absence of a communication plan</p> <p>Absence of networking system between all the hospitals and the MOH.</p> |

¹¹ Source – Author

Results of interview with Category C

Following the above analysis, we may conclude:

- 1- Our MOH is not ready to handle any emergent risk or pandemic situation due to financial crisis.
- 2- Financial situation of the Lebanese MOH and health care institution affects the services provided, and its quality.
- 3- Skillful doctors can do nothing without financial resources and technological advancements
- 4- Technological advancement usage saves lives
- 5- Absence of networking system between the hospitals do not allow our MOH to conduct statistics when needed, consequently it affects MOH decisions.
- 6- Pile stock is not available
- 7- Communication plan is missing.
- 8- Corruption is spread in all the institutions since the management system of a hospital is not linked to financial KPI's, but to fake reports.
- 9- MOH auditors are not very qualified, and the ministry is employing a third party to audit the hospitals when they need accurate results.

All of the above is linked to wrong financial planning caused by poor financial situation, corruption and almost a complete absence of management technological advancement usage.

1.1.2. Horizontal Analysis.

After conducting thirteen interviews with the management experts from three different business fields and following the answers that we received concerning the effect of the financial situation of an organization on the quality of its output, we may declare that all interviewees agreed on the importance of the financial part. Moreover, they approved that the inclusion of financial KPI's would facilitate the measurement or the monitoring process of achievements.

Since the international standard concerned in the quality management systems does not include a specific clause to include the financial KPI's in the organization's planning, our interviewees answered the questions related giving dissimilar clauses numbers, and divergent explanations for the clauses.

Concerning the case of the health care institutions, it was clear that the preparedness of our MOH was not enough to handle an emergency similar to COVID-19 due to the unfortunate financial condition, along with Lebanese fiscal catastrophe. Our interviewees frankly stated that the absence of strong management system using latest technologies led to high competitiveness between the public and private hospitals and the lowest the income for the public sector the highest for private sectors.

Discussion

1. A contextual framework – The Lebanese Health Care Institutions

1.1 Current Situation of the Lebanese Ministry of Public Health (MOPH)

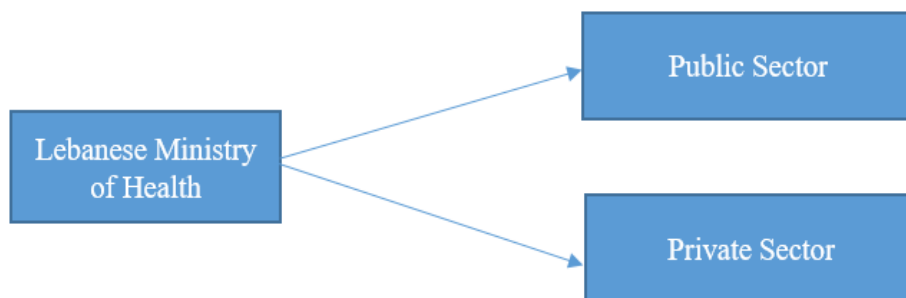
Our Lebanese health care institutions specifically the public sector, is currently facing a serious fiscal incapacity due to the misuse of the financial resources.

- Our ministry of health is receiving donations from third parties and they rely on the received capitals to ameliorate the hospitalization for Lebanese society whether by ameliorating the existing public hospitals or by improving few dispensaries that has been initiated long time ago to provide people with minimum income with the minimum health care needed.
- Our public health care institutions are unable to fulfill the needs and necessities of our Lebanese society due to our Lebanese financial crisis, but on other hand we know that MOPH is taking advantage of a huge capital from international NGOs and donors.
- The fact that during all the past years our Lebanese public hospitals were not ameliorated as planned, the foreign contributors lost their trust in our management system, plans, commitment, and auditing system. Thus, every time the ministry of health is employing a sub-contracted auditor company to conduct an inspection and be accountable for the submitted reports.
- All of the above is a clear indication that our MOPH is not investing in efficient and effective trainings for the inspectors, and the current auditors are maybe skillful but not highly qualified auditors who meet the job specification required by the donors.
- Moreover, if any patient visits whichever private hospital will eventually get a medical card from the hospital administration where all his/her tests and medical history is recorded. However, if the same patient enters another private hospital, his/her doctor won't have access to his/her file due to high competitiveness between the hospitals. Consequently the medical history is never shared with the Lebanese MOPH. As a matter of fact, doctor's office asks their patients to repeat their tests and examination in laboratories they trust which is costing the NSSF and the ministry of health a huge amount of money each year. Please note that we are not discussing whether the patient situation requires the repetition of medical examination on timely basis. We are reflecting the gap in our health care management system that is due to the mislaid and absence of financial planning index and its relation to the quality of the medical service provided by MOPH.

This malpractice open space for corruption by increasing hospitals profits due to the repetition, registration and billing unneeded tests.

- The below area of work will simplify the area of work of the Lebanese MOPH, we considered the Dispensaries managed by NGO's under the Public sector since they collaborate positively with the Ministry of health unlike the private sector.

Figure 07. Area of Work and financement provided by the Lebanese MOPH¹²



Gaps shown in the management system of the Lebanese health care institutions along with the MOPH:

- First Gap: There is no network between the public sector, Private sector and MOPH.
- Second Gap: Medical History is not shared with the MOPH, consequently the statistics made are not reliable.
- Third Gap: Inefficient Financial Planning and use of resources.

We may conclude that:

- The whole system needs to be improved whether by using an acceptable level of technological advancement such as networking system between the hospitals and the MOPH (apps, networking systems).
- The Current system is missing an efficient emergency plan.
- The absence of a developed management system is causing wrong analysis, wrong statistics, wrong financial planning and wrong decision making.

An example can be given of the wrong financial planning, instead of investing in a novel system to limit the corruption inside the health care institutions, the Lebanese MOPH set a financial resourcing limit for each health care institution based on unreal and fake statistics done by unskilled people via inefficient management system.

¹² Source – Author

2. New Business Configuration

2.1. Airplane Business Model

While working on this research, we managed to formulate a new business model that will change the planning for the quality management system in different type of organizations and will adjust the controlling and monitoring measurements of this system. It is useful for any startup (regardless of the field) since the investor will be planning to succeed by linking all his objectives and plans to clear financial indicators. Our new business model is taking an airplane shape and its major components that explain exactly how organizations departments are linked together, affect each other and must work in harmony all the time in every moment in order to reach the organizations aim (destination) safely.

Below is our business model in shape of an airplane to explain how each department affects the whole operation of an organization. We highlighted in our research the importance of the financial key performance indicators along with the technological advancement usage.

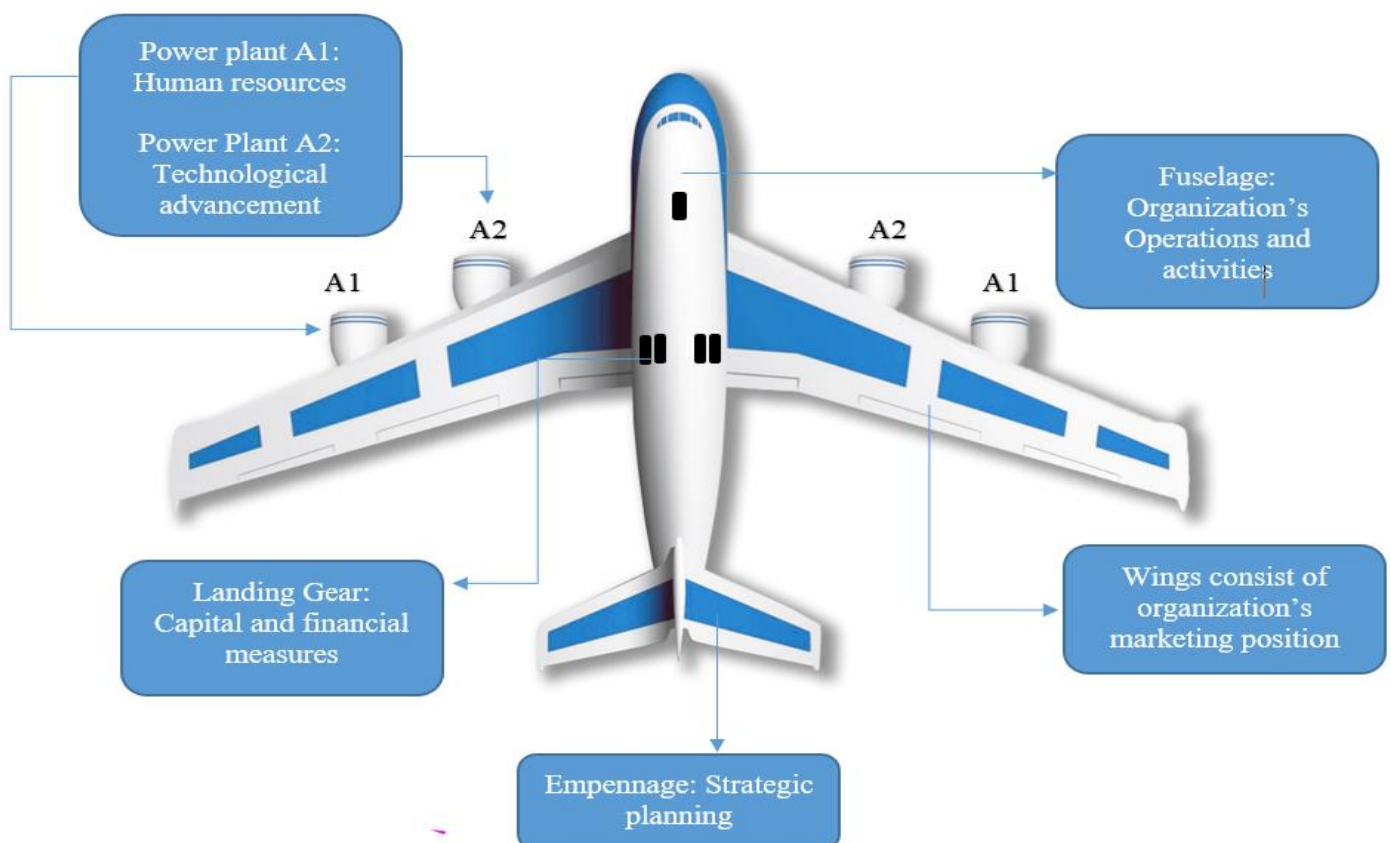


Figure 08. Airplane Business Model¹³

2.2. Linking an aircraft main components with those of a Business Organization

Table 04. From An Airplane Engineering to Buiness Engineering ¹⁴

| Aircraft Components | Organization Components |
|--|---|
| <p>1-Fuselage of the aircraft: The fuselage is one of the major components on an aircraft. It is the long hollow tube that’s also known as the body of the airplane, which holds the passengers, as well as the cargo. This area includes the cockpit, so the pilots are located in the front of the fuselage. Essentially, the fuselage connects all of the major parts of an airplane together.</p> | <p>1-Fuselage of the organization: includes the body of this organization , it’s operations, sales, distribution , different functions and management activities. The systematized and controlled Fuselage , allows a superior market position. A correct loading inside of this hole allow the appropriateness of its navigation.</p> |
| <p>2-Wings: also commonly known as foils, are aircraft parts that are imperative for flight. The airflow over the wings is what generates the majority of the lifting force necessary for flight. Along with the large wings that outstretch from the middle of the fuselage, the wings also include two smaller ones at the back of most aircrafts at the tail.</p> | <p>2-Wings of the organization: is represented by it’s market position. As long as the Fuselage is organized , the highest the ability to gain a competitive market position. The wings should be proportionally convenient to the fuselage size , otherwise , the organization will crush.</p> |
| <p>3-The empennage: is the tail end of the aircraft. It helps with the stability of the plane and has two main components called the <i>rudder</i> and the <i>elevator</i>. The rudder helps the aircraft steer from right to left, and the elevator helps with up and down movement.</p> | <p>3- The empennage of the organization: it is the strategy of the organization that allows It’s stability and influence it’s growth, it controls the ups and downs of the fuselage (operations)and the wings (marketing activities) at the same time.</p> |
| <p>4-The power plant: of an aircraft includes the engine and the propeller. The engine itself is a complicated system that is comprised of many smaller parts like cylinders, fans, and pistons. Together, these aircraft engine parts work to generate the power or thrust of an aircraft.</p> | <p>4-The power plant of an organization: is the Human Resources, technological advancement and competitive advantage.Together they work to generate the power for the organization,so any hole in one of the engines must be filled by the second mechanisms.</p> |
| <p>5-Landing Gear: You cannot have a safe plane without having plenty of landing gear. Not only are these parts imperative for landing, but the landing gear is also used to help an aircraft take off and</p> | <p>5-Landing Gear of an organization: is the Capital, Financial measures and accounting analysis. the organization shall make profits but also the capital is necessary to help during take-off</p> |

¹³ Source – Author

¹⁴ Source – Author

| | |
|--|--|
| <p>taxi. The landing gear includes shock absorbers for a smooth landing and takeoff, as well as the wheels on the plane.</p> | <p>(start-up of the business). Financial controls will affect the whole activity including its quality and safety, thus it is considered as the gear and wheel that secure the take-off, landing and turn around of the organization. It also affect the improvement process of the TQMS, as the presence of QMS system is inefficient without the necessary capital to sustain its effectiveness.</p> |
|--|--|

Conclusion

• General Review

We have conducted an exhaustive literature review as well as thirteen interviews with experts from different business fields in order to discuss whether the current international standards related to the quality management system include financial key performance indicators along with criteria for technological advancement usage. From our work, we noticed that the applicable norms do not include the stated above concepts in a clear manner.

Thus, we formulated the airplane model and applied it within the context of our health care system in order to build a strong organizational structure based on a factual approach for investment and precise financial planning grounded on the usage of technological advancement that facilitates the analysis needed in order to improve the overall system.

• Contribution of Research

Within the context of our all-in-all work, we managed to have several research contributions:

- **An Exhaustive Literature Review:** We started this research by conducting a wide literature review about the quality management system development through the years along with a review about business modeling. Our second step was the preparation of the methodology and methods used in this research.
- **An Interesting Terrain:** The Lebanese healthcare system – one of the most vital and research-covered sectors has been treated within our work.
- **A Crisscross research analysis Process:** Empirical data was treated both vertically and horizontally.
- **A New Business Model Was Proposed:** We proposed a new business model – which we dubbed as “The Airplane Model” that highlights the importance of the networking between the organization component and also take to top the urgency of the inclusion of financial KPIs and technological advancement usage.

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