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Challenges and Implications of Implementing Strategic Intelligence Systems in Mexico

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Abstract

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MTL, Universidad del Valle de México, 2007

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Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Abstract

Business intelligence (BI) allows companies to make faster and better-informed decisions. Unfortunately, implementing BI systems in companies in developing countries is minimal. Limited and costly access to the technology, coupled with the cultural background affecting how people perceive BI, has restricted such implementations. The purpose of this phenomenological study was to explore and describe the lived experiences of chief executive officers (CEOs) in northern Mexico to obtain insight into the challenges of implementing BI systems. Research questions focused on the reasons behind the lack of BI systems implementation and the challenges faced by these officers when implementing a new system. This study employed semistructured interviews of 9 CEOs of small- to medium-sized companies. Interview data were coded using open coding techniques to develop themes or patterns, which in turn were aggregated to address the research questions. The lack of implementation was largely attributed to an economic concern among CEOs regarding the final price of implementation. In addition, the lack of systems offerings of localized systems and the working culture of the personnel were significant factors for the lack of investment. These findings may contribute to positive social change by informing managers and officers of companies in Mexico and other developing countries about the challenges and implications in BI implementation. When BI systems can be successfully implemented, both companies and their customers may benefit from improved information processing such as reduced number of errors and faster response times.

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Dedication

To my friend, Roberto C. Gonzalez, who made all of this possible.

To my wife, Carla, who has inspired me into becoming the best version of me; and to my son, Hector Rafael, may this inspire you to aim always for the stars.

To my father, who always taught me that hard work meant great rewards, and to my mother, who always pushed me to take that extra step. Thank you for all your support and for always being there.

To my uncle “Tolo,” I am sure our discussions would have been epic.

To my sister Angélica, and my nephews, Jacobo and Abraham.

To anyone reading this so that we as humanity can exit Plato’s cave.

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Chapter 1: Introduction to the Study

Companies today have the most access to information that was previously difficult to obtain. This information can generate enough benefit to stay ahead of competitors, understand the behavior of the market, and to anticipate the desires of consumers and customers. Internal information can also identify and analyze company operations to refine business processes and prevent possible mismatches. This information can also set internal communication channels for all employees to coordinate their actions, as well as standardize and improve the performance of each business unit, allowing the identification of opportunities. Because of this access, the ability to share information internally and coordinate with suppliers and customers are key factors for businesses.

Advances in information technology (IT) have allowed organizations to have not only an overview of their competitors but also of themselves, almost in real-time. Multinational companies have been building business intelligence (BI) systems for many years, some dating back to 1990 (Miller, 2001). These systems allow companies to obtain an overview of their internal organization, but they also allow companies to understand their competitors and their actions. The benefits of such systems have been thoroughly analyzed and discussed in developed countries (Miller, 2001). Nevertheless, organizations in Mexico have not taken full advantage of IT. In fact, only a few companies, such as Bimbo and Cemex, have fully implemented a BI system (Pascale, Millemann, & Gioja, 2002). The implementation of a computer system that covers the entire company must overcome cultural barriers, structure, and training of the company

members. When additional language barriers and monetary uncertainty are added, the challenge seems impossible to overcome. However, when a company has the leadership and determination to propose a massive deployment of information systems, difficulties can be overcome.

Extensive research exists on competitive intelligence for companies in advanced economies, such as Al-Zubi, Shaban, and Alnaser (2014); Hosein and Yousefi (2012); Bressler and Bressler (2014); and Summervile and Dai (2012). However, implementing a strategic BI system in countries such as Mexico has not been fully researched. This study, through semistructured interviews with chief executive officers (CEOs) of Mexican companies, identified the reasons for this lack of interest. It will serve as a stepping-stone for further studies in BI systems in Mexico.

This chapter contains a background to the study in which I summarize literature related to the scope of the study topic. I also describe the gap in knowledge. I then provide the problem statement and evidence that this problem is current, relevant, and significant to the discipline. Next, I present a brief purpose of the study along with the research questions. To understand the theoretical background of the study, I the present a conceptual framework, which I will fully reviewed in Chapter 2. I then present the design of the study, as well as the definitions, assumptions, scope, and delimitations, followed by the significance of the study and how will it fill the gap in the literature. I also address the study's professional application and its potential to contribute to positive social change. The chapter concludes with a summary and transition to Chapter 2.

Background of the Study

When Bertalanffy (1972) presented the general systems theory, the author compared a business organization with a biological organism and emphasized the idea that both entities are formed by different parts and that they may act individually; however, ultimately, the result of their combined actions determines their life as a whole. This theory evolved with the addition of several ideas such as Wiener's cybernetics in 1948, the information theory of Shannon and Weaver in 1948, and the theory of games of Von Neumman and Morgenstern (as cited in Bertalanffy, 1972). The application of these theories of evolution in organizations has a clear leader in Senge (2006), who added personal mastery and mental models alongside building a shared vision and team learning, converging into systems thinking. This vision helps explain business in terms of particular kinds of repetitive actions, thus explaining the enterprise because of individual interrelationships between all of its elements, similar to a living organism.

System thinking was a preface to a 1958 article, in which IBM researcher Luhn coined the term *business intelligence* (*BI*). Luhn (1958) defined intelligence as "the ability to apprehend the interrelationships of presented facts in such a way as to guide actions towards a desired goal" (p. 314). BI, as it is understood today, evolved from the support systems that began in the 1960s and developed throughout the mid-1980s to what a management term. This term refers to the applications and technologies used to obtain, organize, and analyze data and information about the operation of a company. The applications and technologies might help obtain ample knowledge of the factors that

affect a company performance, such as sales, production, and internal operations (Azita, 2011).

According to Gates (1999), the 1980s were about improving the quality of the products to obtain a competitive advantage; in the 1990s, a reengineering of processes amplified this advantage; the author envisioned that in the first decade of the new millennium, management focus would be on the velocity in which information flowed throughout the company. Gates predicted that enterprises in the new millennia would digitize all their information into a system that would allow top decision makers to see the status of the company and make better decisions. Companies that did invest in such systems, now called IT systems, had a new challenge to not only display the information to the managers, but to take this information, gather public information from the Internet and other sources, and suggest a course of action. All of these factors evolved into BI. Ivan (2014) established that between 2013 and 2018, the BI market might grow 9% because of the increase of volume of information in almost all industries.

Hemmatfar, Salehi, and Bayat (2010) argued that there has been a shift in how strategic systems are viewed; at first, these systems were "considered to be outwardly focused, that is, aimed at increasing direct competition in an industry visible to all" (p. 159). In recent decades, they have been viewed as enhancing the competitive position of the firm by increasing employees' productivity, enhancing business processes, and allowing managers to take better decisions. The authors concluded that information systems are not only important to business if they want to succeed, but that they are an essential component in a new changeable business environment.

BI can also be perceived as the technology that helps organizations manage their information to achieve effective business decisions (Hočevar & Jaklič, 2010). The benefits of implementing BI systems have been comprehensively studied in developed economies; for example, Chen (2012) stated that BI systems allow companies to have an optimized reporting system resulting in a better-quality decision-making process. This then resulted in an enhanced customer satisfaction as well as increased revenues.

On the other hand, one of the problems with BI systems, as with many IT projects, is the lack of a good evaluation tool that allows managers to justify the value of such investments. Popovič, Hackney, Coelho, and Jaklič (2012) developed a method to identify critical success factors of a BI system implementation. It explored the relationship between the quality of the information fed into the system and its use. The authors concluded that the people in charge of the implementation should focus on the workers' actual needs and not on the delivery of the information per se.

In developed countries, these types of studies justify companies investing in a new system, even though the immediate results might not be visible. In developing countries, on the other hand, not only are economic factors a significant investment barrier, because of a volatile exchange rate to systems usually sold in U.S. dollars. Another factor specific to Latin America is that using an intelligence system has a negative connotation. According to Holzmann (2005), during the 20th century, governments in Latin America used their intelligence services as a military tool to identify and neutralize possible opponents to the government in place. The acquiring and retaining of information was a vital part of agents to ascend the political sphere. In

Mexico between 1938 and 1954, the military intelligence unit was used to benefit the politics of the era (Navarro, 2010), and in many Central American countries. even in the 21st century, intelligence systems are still focused on internal enemies of state (Nilsson & Gustafsson, 2012). According to Lopez de la Torre (2013), all across Latin America, the military intelligence organisms of the early 20th century established the base for the creation of the State intelligence agencies, which later were abused and redesigned into new agencies, creating a natural fear of intelligence and its gatherers and resulting in a negative view of any BI system. Using Latin America's military intelligence units on civilians and the negative effects that has brought civilians in such countries has been researched by many authors such as Estévez (2014), Gill (2013), Green (2015), and Bruneau and Dombroski (2014).

According to Villatoro and Silva (2005), in several countries in Latin America, there are no implementations of the fundamental strategies for national governments to guide their societies to an information-rich environment and some countries are in the process of reformulating a drafted plan. This lack of intelligence culture leaves the companies in such countries with a population with very limited access to IT solutions. Consequently, the population in such countries will not have an IT culture, and any implementation involving IT will present a challenge to the company. The following table represents the thematic priorities status in 12 countries.

Table 1

Thematic Priorities and Status Toward Information Society

Country/strategy	Thematic priority	Stage
• Argentina/National Program for the Information Society in 2000 (http://www.psi.gov.ar)	Infrastructure and universal access to information technology	Reconstruction of the strategic vision
• Bolivia/Digital Bolivia Agenda, 2002 (http://www.enlared.org.bo/etic/cgdefault.asp)	E-Government	In process of elaboration
• Brasil/Program for the Information Society in Brasil (http://www.socinfo.org.br)	E-Government Generic services and infrastructure	Reformulation of policies
• Chile/Information Society Program in Chile, 2003	E-Government	Implementation
• Colombia/Connectivity Agenda, 2000 (http://www.agenda.gov.co)	E-Government IT Infrastructure E-Commerce	Implementation
• Ecuador/National Connectivity Agenda, 2000 (http://www.conectividad.gov.ec)	Infrastructure and universal access to information technology	Implementation
• Dominical Republic/National Strategy of IT for development, 2003 (http://www.edominicana.gov.do)	IT Infrastructure E-Government	Recently formulated strategy
• Trinidad y Tobago/National Plan for IT, 2003	IT Infrastructure E-Government	Formulated strategy
• Venezuela/Presidential Decree, 2000	IT Infrastructure	There is a coordinated agency still established for this task.
• Jamaica/Strategic Plan for Information Technology, 2002 (http://www.janc.org/programs/jaitplan.pdf)	E-Government	Only the strategic plan has been drafted.
• Mexico. National E-Mexico System, 2000 (http://www.e-mexico.gob.mx/wb2/eMex/Home)	IT Infrastructure E-Government	Implementation
• Perú/National Program for the Development of the Information Society	IT Infrastructure E-Government	Formulation of policies

Note. Adapted from Villatoro & Silva (2005).

Implementing BI systems in Latin America differ significantly from those in developed countries. Holzmann (2005) affirmed that the negative and oppressive use of intelligence agencies in Latin America has negatively influenced businessmen of such countries, an affirmation that is supported by Ugarte (2001). Some studies performed by authors such as Siffat et al. (2011); Bhuasiri, Xaymoungkhoun, Zo, Rho, and Ciganek (2012); and Lawrence (2010) have presented some obstacles to developing countries for an information system implementation. It is not sufficient to successfully implement a BI system, but employees must understand a complete new way of working and interacting with their coworkers, as intelligence has always been perceived as something of value that should not be shared (Montenegro, 2013).

According to Aguilera-Enriquez, Gonzalez-Adame, and Rodriguez-Camacho (2011), one of the main difficulties in establishing an IT solution in companies located in Mexico is the lack of access to capital. Even when government programs aid in such implementations, the managers are "ignorant of funding sources and the best way to present their business situations and needs to potential funders" (p. 4). Another challenge is the family business tradition in Mexico; it is often based on the fact that only the patriarchs or leaders of the company know its secrets and keep them to themselves until it is time to succeed power. According to Fernandez (2013), in Mexico the majority of the large national firms are of familiar origin, attending thus to the characteristics of a family business.

Problem Statement

BI systems are an essential component of a modern enterprise's information infrastructure, as they contribute to its success and competitiveness (Davenport, Harris, & Morison, 2013). Sauter (2010) also established that through the use of BI systems employees in a corporation are given the necessary tools to act and make decisions, in accordance with Amesti (2014), who also established the empowerment of people through the use of BI systems. Nevertheless, few small to mid-size organizations in Mexico have taken advantage of IT and fully implemented a BI system. According to Linares (2012), the gap between the implementation and use of BI systems between advanced economies and countries in Latin America is growing due to economic factors. The problem is the limited understanding of the factors contributing to the challenges of implementing BI systems in Mexico.

Purpose of the Study

The usage and implementation of IT systems in Mexico are scarce; there is not nearly enough information as to how to successfully implement a BI system in a Mexican company. The purpose of this qualitative phenomenological study was to explore and describe the lived experiences of CEOs in Mexico to obtain insight into the factors that have contributed to the challenges of implementing BI systems.

Through interviews, the perceptions of some CEOs regarding the challenges and implications of the implementation of such a system in their organizations were explored. An examination of the thoughts of CEOs discovered the lack of information in BI systems, as well as an examination of the thoughts and perceptions of such officers

regarding the mentioned IT tool. The results of this study can be used to enhance current IT implementations in Mexican companies.

Understanding these factors will provide a foundation for future studies in Mexico and countries in Latin America. It will also deliver strategic information to executive officers that can apply to their enterprises and attain a successful BI implementation. With the understanding of how current CEOs think of IT implementations, current students will have access to current managing techniques of Mexican CEOs.

Research Questions

To understand the cause of a lack of implementation of BI systems in companies in Mexico, the following research questions were constructed to address the purpose of the study:

RQ1: What are the main reasons stated by CEOs as the cause for the lack of implementation of a business intelligence system in small- to mid-size companies located in Mexico?

RQ2: What are the challenges CEOs of small- to mid-size companies in Mexico confront when trying to implement a new business intelligence system?

Conceptual Framework

Knowledge based theory (KBT) establishes that information is the primary resource for a firm and because employees have such knowledge, the shareholder value approach must consider knowledge as a vital part of its strategy (Grant, 1996). This author's theory is aligned with Spender (1989), who established that "the organization as, in essence, a body of knowledge about the organization's circumstances, resources,

causal mechanisms, objectives, attitudes, policies, and so forth" (p. 185). KBT theory also recognized that it is "the ability to transfer and aggregate knowledge [that] is a key determinant of the optimal location of decision making authority within the firm" (p. 111). This last affirmation is the core of a BI system, how an employee can and will benefit the company by using and transferring its knowledge into the company.

Unfortunately, this theory has not yet reached developing economies. Linares (2012) noted there is a growing difference between advanced economies and Latin American companies about the implementation and use of BI systems. Some of the reasons given by Aguilera-Enriquez et al. (2011) for Linares's observation might be attributed to the fact that the officers in small businesses in Mexico have a lack of funds and staff. These leaders must work with limited resources, as well as with a background in a family-oriented way of doing business (Fernandez, 2013).

Cataldo, McQueen, and Sepulveda (2011) provided three reasons why leaders in small and medium companies do not use IT tools, such as a BI system. The first was a lack of a clear map of implementation, second given their limited resources they have a strong operational focus and their priority is to run the business, and finally they normally have an inadequate staff for IT management.

These ideas were analyzed to understand and confirm if the theoretical background of the reasons behind a limited implementation of BI systems in Mexico is in line with theories, such as the theory of administrative behavior. This theory postulated by Simon (1947) stated that even though the manager of a company is a rational man, he

might not have enough abilities by himself to make better decisions, thus the need for a system to aid him in the matter.

Related to how the users of a new technology might accept it and start using it, the technology acceptance model (TAM) was reviewed. Developed by Davis (1989), this model is based on Ajzen and Fishbein's (1980) theory of reasoned action (TRA). TAM was specifically designed to predict the acceptance of information systems by their users in the organizations. According to Davis, the primary objective of the TAM was explaining the factors that determine the use of IT tools by a critical number of users. The model suggests that the perceived usefulness and the perceived ease-of-use are determinant in the intention of an individual to use a system.

Even though the TAM aids IT officers in knowing if a technology is going to be utilized in an optimal way, it is necessary to identify the external variables. These variables directly influence the perceived usefulness and perceived ease-of-use by users and establish the relationship that they maintain with the resulting use of technology. Orantes (2011) established that in Mexico this theory, alongside other IS theories, is little known to managers who do not work at international companies. This lack of knowledge was confirmed by Fernández, Bautista, and Sánchez (2012) as they also proposed a model for public universities to start teaching this model as well as the theory of planned behavior (TPB).

TPB, developed by Ajzen (1991), helps understand how the behavior of people can be changed. This theory predicts deliberate behavior, meaning that even though human behavior might be believed as voluntary it can be predicted. It was preceded by

the TRA, and it evolved when Ajzen discovered that human behavior is not totally voluntary and under control, leading to the addition of perceived behavioral control, and further to the theory of planned behavior, followed by the technology-task fit (TTF)

Finally, the unified theory of acceptance and use of technology (UTUAT) was considered. This theory arises from the need to create a common theoretical reference to retake the constructs offered by other theories and models such as the mentioned TAM and TPB, which have proven to be useful in assessing acceptance of technology and realized an evolution in explaining the phenomenon. The authors of this theory studied and formulated a unified integrated model. In this theory, there are four main factors: performance expectancy, effort expectancy, social influence, and ease conditions, which are moderated by gender, age, experience, and willingness to use.

Assumptions

The primary study assumption was that due to several factors there is limited knowledge and implementation of BI systems in companies in emerging economies, such as Mexico. Some assumptions for the study were the following:

1. CEOs of small and medium companies in developing economies experience different levels of access to technologies.
2. CEOs are responsible for the implementation of the systems in their companies.
3. CEOs have a clear vision of the objectives of their companies.
4. The participants of this study, being the CEOs, thoroughly know their company.

5. Cultural elements differentiate companies in developing countries versus companies in developed economies.
6. The interviewed participants will understand the questions and give honest answers.

Scope and Delimitations

The focus of the study was small and medium companies in Mexico. According to Federal Law for Development of Competitiveness for micro, small and medium enterprises the classification of a small and medium business in Mexico is dependent on the industry in which they are located (Secretaria de Economia, 2002). This follows the legal definition that these are companies with less than 250 employees in the industrial sector and less than 100 employees for those enterprises in the commerce and service industries. Nine semistructured interviews were given to CEOs who were contacted using the public directory of Saltillo's Chamber of Commerce and the Northeast chapter of the National Chamber of the Transformation Industry will be analyzed.

Delimitations of the study included the size of the sample; data was collected from the sample until data saturation occurred. The diversity of such companies was in relationship to the services they render, but all of them render services to a local market, and all of them were located in Mexico. As stated earlier the sample size was small, as is customary in qualitative studies.

Limitations

The use of semistructured interviews allowed the extraction of rich in-depth information, but also limited the size of the sample. The intention for the selection of a

small group of CEOs was to ensure that the study covered the reasons for a lack of implementation of a BI system in their companies and specifically concentrated on this subject.

Another limitation is the lack of knowledge of these officers regarding BI systems, even though the participants were educated high ranking officers in small to medium companies, because BI systems are still very new in developing countries, such as Mexico, these officers were not fully educated in the concept. To address this situation, a presentation of BI systems was given to the participants who required it, followed by a session of questions regarding BI.

Finally another limitation was the particular location of the study because of its cultural background and the proximity to the United States, as well as the specific characteristics, both demographic and educational: the area in which the study was done has more than nine technical universities, something not common in Mexico. Because of this the researched group of companies in one region might share characteristics that may differ from companies in the rest of the country, thus further studies in other parts of Mexico could be made to confirm the results obtained in this study.

Nature of Study

The goal of the study was to explore the reasons behind the lack of implementation of BI systems in Mexico. The study was exploratory in nature and identified the problem for the implementation of an intelligence system in a company. A phenomenological study, through the use of semistructured interviews, obtained the pertinent information regarding this subject with rich data and flexible data collection.

A qualitative design, as opposed to a quantitative design, was appropriate because there is very limited information regarding the implementation, or lack thereof, of a BI system in Mexico. With the chamber's public directory, a set of CEOs were interviewed regarding their knowledge of BI systems and their reasons for not implementing one. These interviews were then analyzed and coded for interpretation, and with software, conclusions were drawn.

This type of study gives information regarding the reasons behind such lack of implementations and what barriers CEOs in Mexican companies must confront when implementing a new IT project. This information may allow scholars in Mexico to further study this phenomenon. It may also provide some ideas for current CEOs to confront these challenges and perhaps start a BI implementation.

Definition of Terms

Adoption: The action or fact of adopting or being adopted (Stevenson, 2010).

Business intelligence (*BI*): According to Luhn (1958) it is defined as "a comprehensive system assembled to accommodate all information problems of an organization" (p. 314).

Capital: "Wealth in the form of money or other assets owned by an organization, contributed for a particular purpose such as starting a company or investing" (McKean, 2005, p. 417).

Chief executive officer (*CEO*): This term is used to homologate the different positions that the Mexican companies name their most prominent position, such as general manager, president, and director among others.

Implementation: The process of putting a decision or plan into effect; execution (Stevenson, 2010).

Information: Facts provided or learned about something or someone (Stevenson, 2010).

Information system: A set of interrelated components that capture, process, store, and distribute information to support decision-making, coordination, analysis and control in an organization (Laudon & Laudon, 2012).

Information technology: The study or use of systems, especially computers and telecommunications for storing, retrieving, and sending information (Stevenson, 2010).

Project management: The process and activity of planning, organizing, motivating, and controlling resources, procedures and protocols to achieve specific goals in scientific or daily problems (Stevenson, 2010).

Small and medium companies (*SMC*): According to Mexican Law (Secretaria de Economia, 2012) small and medium companies are those with less than 250 employees for industry and less than 100 for service and commerce.

Significance of the Study

There is a lack of understanding of the challenges and implications of implementing a strategic BI system in companies in a country like Mexico. The way businesses operate in Mexico requires an in-depth analysis of such implementations. The results of this study may provide insight into how companies in Mexico can implement a strategic BI system. Foody (2009) established that in a volatile economy, such as Mexico, an implementation of a BI can improve decision making, thus adding a competitive

advantage to the company in comparison to those in the Mexican economy. It is therefore very important to know the key conditions required for the successful implementation of this type of information system. For example, the variables affecting the macroeconomic and social environments in developing countries, the strength of enterprises services offered, the number and position of the competitors they face, the availability of qualified and competent staff, as well as the intrinsic strengths and weaknesses of the company. The identification and understanding of the main factors serve to facilitate the establishment of the strategies and organizational schemes for companies in developing economies.

Scholars may find significance in this study, as it may serve as a starting point for future research on the implementation of BI systems in small and medium Mexican companies. Even though there is some initial research on TAM and TPB in Mexico; however, what was not found in the literature were the reasons for the lack of BI implementations. Academia may benefit, as it is a stepping-stone to a future of locally adapted research, as well as an initial element that can be used for replication in other parts of the country with different cultural, educational, and demographical backgrounds.

Business leaders in companies in Mexico may benefit from the findings of this study. By understanding how BI systems work and how they can facilitate their daily activities, they might be interested in researching and perhaps implementing a BI system. Other countries with similar economies and considering their differences and own attributions might also find the results from this study interesting and applicable. Practitioners may benefit from this study once Mexican companies become aware of the

challenges and implications of instigating a BI system. They might be encouraged to implement some sort of BI, resulting in a more productive business, creating social change.

Summary and Overview

According to Gates (1999), the decade of the 1980s was about improving the quality of the products to obtain a competitive advantage; in the 1990s, this advantage was amplified by a re-engineering of processes. The author envisioned that in the first decade of the new millennium management focus would be about velocity in which information flowed throughout the company. Gates predicted that enterprises in the new millennia would digitize all their information into a system that would allow top decision makers to see the status of the company and make better decisions. Companies that did invest in such systems, now called IT systems, have a new challenge to not only display the information to the managers, but to take this information, gather public information from the Internet and other sources and even go as far as suggesting a course of action. BI is a concept very well known by companies in developed economies. In countries that are still in their economic development phase, such as Mexico, this concept is not well known. The use of IT can be a challenge to Mexican companies not only because of the technology and the skilled labor required to use and take advantage of such tools (Fernandez, Bautista, & Sanchez, 2012), but also because of the traditional challenges that companies in advanced economies face when implementing a new technological system. Despite these difficulties, BI systems can be implemented in Mexico successfully, as seen in companies like Bimbo or Cemex (Pascale et al., 2002), with

results that demonstrate the advantages that a well-implemented system can bring not only to companies in developing countries, but also to companies in advanced economies.

The information presented in Chapter 1 includes the rationalization and foundation for the research study; this was done through a description of the topic, the statement of the problem, its background, purpose, and the nature of the study and its significance. Research questions were also included in this chapter as well as its assumptions, limitations, and scope. Chapter 2 includes a review of the literature and its theories regarding the use of technological advancements as well as the implementation of new IT systems. Chapter 3 contains a discussion of research design, the nature and number of participants, as well as how the information was collected and analyzed. Chapter 4 contains the findings of this study and finally, Chapter 5 includes the interpretation of the findings, as well as implications for social change and recommendations for future research.

Chapter 2: Literature Review

BI systems are an important component of a modern enterprise's information infrastructure, as they contribute to its success and competitiveness (Davenport et al., 2013). Nevertheless, few small- to mid-size organizations in Mexico have taken advantage of IT and fully implemented a BI system; in fact, according to Linares (2012) the gap between the implementation and use of BI systems among advanced economies and countries in Latin America is growing. The problem researched in this dissertation were the challenges and implications of the implementation of a BI system, through the lived experiences of Mexican CEOs who have not fully implemented BI systems in Mexico.

The literature review is organized in two ways. First, the review covers general systems theory and its evolution to systems thinking, which leads to organizational learning. It is followed by a review of the learning organization and how it uses BI and its characteristics. Finally, a review is offered of the business justification of BI and the value it adds to a business. KBT and the theory of administrative behavior are also reviewed in this area as part of BI use by employees and their decision-making processes, as well as the technology acceptance model, the theory of planned behavior, and the unified theory of acceptance and use of technology. I will also review cultural and social backgrounds and how these affect implementation in developing countries.

Literature Search Strategy

The literature review is based on information accessed via various databases, depending on the type of information researched. For the general systems theory, its

evolution and other theoretical foundations were researched in the ProQuest database as well as Google scholar, Questia databases, and the Internet in general, by using the following search terms: *systems theory*, *systems thinking*, *organizational learning*, *knowledge-based theory*, *theory of administrative behavior*, *technology acceptance model*, *unified technology theory*, *business intelligence*, *BI implementation*, and *BI strategies.*

Using specialized research databases such as ProQuest and Questia, only a very few documents regarding BI systems in Mexico were found. I had access to the public library of the Autonomous University of Coahuila (UAdeC), the private library of the Monterrey Institute of Technology and Superior Studies (ITESM), and the private library of the Universidad del Valle de Mexico (UVM). These libraries provided limited print information on the use and implementation of IT systems in Mexico. Some of the primary terms used in these library searches were: *challenges of technology in Mexican companies*, *use of information in Mexico*, *and IT management*, and *adoption in Mexican companies.*

Conceptual Framework

Strategic thinking establishes the need for an analysis of the competitive forces that affect the company as a stepping-stone to properly define its strategic elements. It is also necessary to identify and analyze the competitive advantages of the organization, that is, the attributes or resources that differentiate a company from its competitors and allow it to defend or improve their competitive position, thereby improving performance. Therefore, all activities of the firm have a component of information, which can be

identified and managed through IT. In addition, using such systems will reduce costs, generate new activities with higher added value, and optimize relationships between such activities and the value chain between enterprises. From these considerations, I can deduce that IT, from a strategic point of view, not only represents a tactical role, but it has become a crucial element for the competitiveness of the company. This includes acquiring a strategic nature, which results in better performance of the company, measured through a series of variables such as sales, profit, profitability, productivity, and differentiation from the competition. This is where a company is perceived as a system, not only of parts or information but also as an organism composed of many elements.

Bertalanffy (1972) introduced the idea of general systems before modern system theories such as systems engineering were developed. Bertalanffy used an organism metaphor from biology that emphasized the consideration of the organism as a whole system but formed by several different parts that may act individually. The researcher saw the similarities between the biological sciences and the principles of organization at various levels, given that they both act as a group of individuals, being cells in a biological entity or persons in an organization, to obtain a result as a group, such as an organism or an organization. The idea of an organization as a complex system allowed managers to "administer, organize, analyze, manage, and govern complex systems as if they were a collection of isolated parts" (Orr, 2014, p. 3).

The general systems theory by Bertalanffy (1972) is "a logico-mathematical field whose task is the formulation and derivation of those general principles that are

applicable to systems in general" (p. 411). It was important for Bertalanffy to develop a theory of open systems–that is, a system of components that interacts with its environment, analyzing the interconnections between the elements and how all of them together act in synergy as a simple being. It represents a broad perspective that greatly transcends the problems and technological requirements, a shift that has become necessary in science, across the range of disciplines from physics and biology to the social and behavioral sciences to philosophy. While the field of application of general systems theory recognizes no limitations when used in human, social, and cultural phenomena, it is cautioned that its roots are in the area of natural systems (organizations) and artificial systems (machines). While most acknowledge equivalence between bodies, machines, men and forms of social organization, the greater the chances for successful implementation of the approach of general systems theory, but the more we experience the attributes that characterize the human, social and cultural systems they will expose their inadequacies and deficiencies.

The Society for General Systems Research started in 1954 to promote the development of theoretical systems applicable to more than one compartment of traditional knowledge. Its main functions were, according to Bertalanffy (1972), (a) to investigate the isomorphism of concepts, laws, and models in various fields, and promote useful transfers from one field to another; (b) encourage the development of adequate theoretical models in fields which lack them; (c) minimize duplication of theoretical effort in different fields; and (d) promote the unity of science by improving communication among specialists.

By the end of the 1940s three key contributors to Bertalanffy's general system theory coincided: *Cybernetics* by Wiener was published in 1948, following recent advances in computer technology and based on an exchange of information between systems and environment and within the system. The information theory of Shannon and Weaver in 1949, and finally game theory by Von Neumann and Morgenstern were also developed.

Systems theory tried to address the limitations of analytical procedures in science; for example, a chemical reaction in which the application of the analytical procedure depends on two conditions: that there are no interactions between parts, and that the relations that describe the behavior of parts are linear. Such conditions are not met by the entities called systems, although the parts in the system do interact with each other, and it is this interaction that gives the result. In addition, this relationship is rarely, if ever, linear (Bertalanffy, 1972).

Bertalanffy (1972) identified different theories from which general systems theory evolved. The classical theory applies to classical mathematics systems; it aims to set out principles applicable to systems in general, such as computerization and simulation. A set of simultaneous differential equations that act as a path towards a model or definition of a system are tedious to solve, if linear, even in the case of few variables, but as they evolve and enlarge they cannot be solved, allowing for laboratory experiments to be replaced by computer simulation.

General systems theory has aided the development of other theories such as set theory, in which closed and open systems can be collected into a set: in other words, a

collection of systems, and the theory of graphs that prepares related structures represented in a topological space, which can be applied in biology. General systems theory is the scientific study of the individuals and the wholes that not long ago were considered metaphysical notions transcending the frontiers of science. To treat them new concepts, models, and mathematical fields have been developed. The interdisciplinary nature of concepts, models and principles relating to the system is a possible approach to the unification of science. The problem of the general systems theory is to identify what can be said of the material systems, the information systems, the conceptual systems, and other systems. This is known as the epistemology of systems; perception is not a reflection of real things, or knowledge is an approximation to truth or reality; it is an interaction between the known and the knower, dependent on multiple factors of biological, psychological, cultural and linguistic reasons.

The evolution of systems theory applied to an organization has a clear leader in Senge (2006). Senge cited five component technologies that are converging to innovate, three regarding individuals: systems thinking, personal mastery, and mental models; and two related to groups: building shared vision and team learning. For Senge the fifth discipline is the most important of all: systems thinking, “the discipline that integrates the disciplines, fusing them into a coherent body of theory and practice” (Senge, 2006, p. 12). This fifth discipline helps us to think in terms of systems, since reality functions based on global systems; and for this it is required that we understand the world around us. To reduce our anxiety about the world's degree of complexity, from childhood humans are taught to isolate the elements of reality, always assigning a cause to each

effect in more or less complex chains. The essence of the fifth discipline is a change of perspective on the situations we live in to identify the interrelationships rather than associating them with linear chains of cause-effect.

Systems thinking's foundation is that even though elements of a system are observed individually, the conjunction of its parts is much larger. It is based on systems dynamics, and it is highly conceptual; it provides ways to understand business in terms of particular kinds of repetitive interactions or archetypes. It is a conceptual framework which essentially claims to produce a shift of mind that aids us in seeing interrelationships between elements and not a linear chain of cause and effect, and assisting us in thinking in processes of change, rather than snapshots, which may also include explicit system models in more complex situations. There are some key elements of systems thinking; first systems are divided into subsystems, which exist within the system, and suprasystems, the universe in which the system operates. Systems also have boundaries defined and are fitted with sensors that perceive its environment. Any system has as its main purpose the equivalent purpose, that is, all the elements that make up work on the basis of achieving the same objective or purpose. Another element is that computers generate synergy between its parts; in other words, the total is always greater than the sum of its parts. This characteristic is also called reinforcing feedback; it allows the system under study to accelerate its growth or decline, creating a snowball effect to a limited extent, where the balancing feedback begins to occur, which tends to keep a certain state of things, for better or worse.

Another characteristic is that the systems have a regulatory element of its processes to keep its balance, called homeostasis or equilibrium feedback. Any system has within it a mechanism of delay or waiting. This element means that there is always delay between the cause and the effect desired. The key to understanding the processes of feedback and delay is to understand that under the appearance there is always an independent system that develops according to its laws, and that the more we try to attack the surface symptoms without paying attention to what happens in the background, the more energy will be spent in vain.

Systems thinking is not intended as a simple tool but rather provides a new mental model of organizations (Senge, 2006); it should not merely be a tool for solving practical problems, but it should also aim to change the individuals. Senge asked his readers to practice a mental renovation, an interior change or metanoia, to obtain a systemic view. It is easy to think of this systemic view as something easily achievable, given that some of the elements in the organization may be ready for the change, but it soon may turn into something impossible to obtain, given the nature of people to reject changes on a first basis. As Senge stated, “New insights fail to get put into practice because they conflict with deeply held internal images” (p. 159).

The use of systems theory is ample and applies to BI in many ways. A clear example is the sociotechnical theory, developed by Trist. This theory considers that the objective of optimization can be achieved only if technological and social subsystems adjust to its environment; in other words, it is only attainable with the interaction of a human with a computer (the use of BI). Bhattacharya and Kundu (2013) considered the

organization as “an open social action system consisting of multi-forms of structures and processes” (p. 94). Other theorists such as Sheppeck and Militello (2014) defined an organization as “an open system whose components interact to produce a whole entity” (p. 4). The correct performance of the entire organization depends on the performance of each of its parts. The attributes of each part of the company should be aligned with the goal of the entire enterprise. Furthermore, the relationships between the mechanisms or parts of the system called behaviors must be clear and timely, among other features. In the case of social organizations, these relations are mainly given by the flow of information, both formal and informal communication. The information is converted into an integrating agent par excellence.

Systems theory is conceptually characterized by its holism and technical heritage; it can be stated that systems thinking has the ability to analyze a problem, taking into account the full interaction of the elements, thus its holism, attending to the delay of the interrelationships and the internal and external feedback of the system. The accumulation and management of information in companies have enabled them to conduct business on a larger scale, some of them even globally. The correct and efficient use of information from different sources has allowed some companies to obtain a competitive advantage; Gates and Hemingway (1999) reaffirmed this when they stated, “How you gather, manage and use information will determine whether you win or lose” (p. 3). It is understood by managers that a company has to have is an integrated structure of information and personnel to be better prepared than their competitors, this way they can quickly and effectively respond to the markets. They also need to have a system that

manages such information, allowing it to be used, reused, and constantly renewed by the members of the organization. This is in part what systems thinking is all about, and finally it is the ultimate goal of a BI system.

Reasoning in terms of systems plays a key role in a variety of fields, from economic, trade and services, public and private industrial enterprises to issues dedicated to pure science. Technology is no longer thought in terms of single machines but as systems working together. It calls for a *systems approach*, in other words, to find ways or means to achieve a certain goal requiring the systems specialist to consider possible solutions and choose the promising optimization with maximum efficiency and minimum cost of a network of extremely complex interactions. This involves a fundamental reorientation of scientific thought.

There is an important link between cognitive psychology and organizational learning, creating a broader conception of knowledge management: artificial intelligence studies. Artificial intelligence is a field in which cognitive psychology and neuroscience are combined in an effort to model machines as humans. It is important to note this relationship because artificial intelligence addresses problems of interrelations within a whole (Bertalanffy, 1972, p. 15), similar to organizational learning, and ultimately to BI. Therefore, human learning serves as a guide to the artificial learning of machines, and vice versa. The artificial learning of machines serves as a guide to organizational learning, as it emulates and models human psychology.

Unfortunately, to achieve organizational learning there has to be a change in how a company is perceived; it implies the fundamental transformation in almost everything

related to the technology, the processes, and its application in the business. Organizations that do not make this change will fail, become irrelevant, or cease to exist. It requires conceptualizing the company as if it were a system, defining it within a dynamic reference frame that allows the definition in one dimension of the company as a total integrated system and consequently, in another dimension, which allows us to insert the company as one component of a larger system and therefore interrelated.

Organizational learning has always been a concern for managers; it is believed that the primary repository for corporate knowledge is a company's personnel, and according to Dalkir (2013) only 20% of the knowledge that is available to the organization is actually used. This belief states the importance of creating a knowledge management system that can ultimately serve a learning organization in two ways: first, give the attitude needed for the change, and then contribute to an established learning organization. A learning organization is one with the ability to create, acquire and transfer knowledge and change behavior based on that learning. These organizations belong to a new type of system, they understand that continuous improvements require a commitment to learning, to learn how to learn together, and they know that if that learning cannot be measured, it cannot be improved. Some characteristics of the personnel in a learning organization are that they feel sure of themselves and their work. People are free to make decisions within their competence; the communication is fluent, rapid, and unimpeded, and people get along, there is confidence to say things. Another important characteristic is that there are clear monitoring and measurement systems.

Such a knowledge management system is ultimately a BI system. In fact, Hislop (2013) defined the knowledge worker as "someone whose work is primarily intellectual, creative, and non-routine in nature, and which involves both the utilization and creation of abstract/theoretical knowledge" (p. 71). It is necessary to study not only isolated parts and processes, but also to solve the critical problems encountered in the organization and the order that unified them, resulting from the dynamic interaction of parties, and make them behave differently when studied in isolation or within the whole.

According to Broekel and Boschma (2012), geographical proximity is just one of the proximities that are relevant in a modern world; other crucial proximities to be considered by enterprises are cognitive, social and organizational. The permanence of a competitive advantage in a global economy is local, pursuing the concentration of abilities and highly specialized knowledge. It was at the end of the nineties when knowledge began taking a place in management theory and thus led to the creation of knowledge-based theory that considers knowledge as the most important resource of the firm.

Roberson (2013) wrote that knowledge-based resources are very difficult to replicate because of their social complexity. According to Roberson, this perspective is useful in this type of complexity because it "incorporates the bottom line implications of strategic management" (p. 242). The difficulty of imitation of the workforce is what finally gives a company a competitive advantage.

Even though the resource-based view of the companies recognized that knowledge in a company contributes to a competitive advantage, they maintain that the

perspective based on resources as a whole brings the competitive advantage. In other words, according to the resources-based view, knowledge is only a generic resource and not treated differently from any other resource the company deals with.

From the resource-based view of the company, there have been some specific developments, such as the leadership strategy and the perspective of the firm based on resources, currently known as knowledge-based theory. This theory considers the firms as heterogeneous entities oriented toward knowledge. Such an approach has its origins in Polanyi (1966), who classified knowledge in two categories: explicit or codified and tacit; the first one refers to knowledge that can be transmitted in a formal and systematic language, and the later to knowledge which has some individuality, thus making it difficult to transmit.

This knowledge was later defined by Mocanu, Litan, Olaru, and Munteanu (2010) as a critical factor in success for a modern company. It is its ability to take advantage of this information, both internal and external, and its management, which will lead a company to succeed. And according to Gold, Malhotra, and Segars (2001), BI allows such firms to generate knowledge about themselves and their competition.

Senge (2006) stated that an organization learns when it maintains a philosophy focused on the anticipation, reaction, and response to change, complexity and uncertainty, emphasizing the fact that the only sustainable source of competitive advantage in organizations is the growth rate of their knowledge. The cycle then would be illustrated by this relationship: the more the organization learns, the more it can innovate, and the more potential and current resources can be generated. Therefore, this

creates the ability to produce more goods and services on the market, bringing the organization higher revenues than its competitors; as they reach such organizational knowledge that provides a new learning experience and the cycle starts again.

The theory of administrative behavior postulated by Simon (1947) stated that even though the manager of a company is a rational man, he might not have enough abilities by himself to make better decisions, thus the need for a system to aid him in the matter. If the manager were to make the decision by himself, according to Simon, the human brain is not efficient enough to analyze and optimize the decision. The need for a system is clearly indicated, not only by the lack of the human mind, but it is heightened by the faster and more efficient technologies.

To explain organizational behavior, the behavioral theory is based on the individual behavior of people. For this, it is necessary to study human motivation. Every behaviorist author agreed that the manager must comprehend human needs to understand better human behavior and use motivation as a powerful means to improve the quality of life within organizations.

In this regard, Simon (1947) argued that the theory of administrative behavior is the theory of bounded rationality, and intentional behaviors of human beings are satisfied because they have the intelligence to get the maximum, adding that the limits of rationality are the central concern of administrative theory. Therefore, this becomes the boundary between rational and irrational aspects of human social behavior.

Simon (1947) added that the decision processes and other aspects of economic institutions exist in the minds of people. Humans change with any change in knowledge

and any changes in the means and methods of calculation. According to Simon, it is for this reason that the attempt to predict and prescribe human economic behavior by deductive inference from a small group of premises should fail and has failed.

Finally, we can gather from this theory that managers in higher positions will make a decision about *what*--this is what should be done--and employees in lower positions will make a *how* decision. Through the use of a BI system both employees and managers can corroborate and work to bring the *what* and the *how* decisions together.

Related to how the users of a new technology might accept it and start using it, is the technology acceptance model (TAM) is used. Developed by Davis (1989), this model is based on Ajzen and Fishbein's (1980) theory of reasoned action (TRA). TRA is based on the assumption of conscious control of the subject before their social behavior, so that the execution of any action, behavior, or conduct is done through a conscious process. In TRA, behavioral intention is the key to the human behavior element, since it is directly related to the decision not to run or engage in a particular action, and is therefore the most immediate determinant of any conduct, defined as the probability opinion of the concrete and specific embodiment of conduct. For Ajzen and Fishbein, behavioral intention is determined by two main components that determine the performance of a behavior: first is an attitudinal component or personal factor behavior based on beliefs and attitudes toward the behavior, the attitude toward the behavior is defined as the learned predisposition to respond to an object in a favorable or unfavorable. Second, a component based on normative beliefs or social factors, and defined by specific social contexts, is called the subjective norm. The subjective standard includes a person's perceptions about

different social pressures they are subjected to by their environment in relation to the object.

From the TRA, TAM picks up the explanation of the factors that favor the use and acceptance of information systems from beliefs, attitudes, and intentions. But by limiting to the field of systems and IT, they reduce the number of variables to monitor in regard to TRA, and focus on two salient beliefs as determinants of the adoption and use--specifically, perceived usefulness and ease of use perceived. Perceived usefulness is defined as the subjective probability that a future user perceives that using a particular system improves performance within the organization in which he is immersed and ease of use perceived refers to the degree to which a user expects future system usage in question is free from stress (Davis, Bagozzi, & Warshaw, 1989)

Davis, Bagozzi, and Warshaw (1989) argued that the root of the controversial role of perceived ease of use comes from the nature of the task to study. Thus, if the task is of intrinsic nature—that is, it takes the system to perform the task—the relationship with the attitude will also be direct. However, for tasks that the system only offers support or medium on which to perform the task, and, therefore, the task of extrinsic nature, the relationship with the attitude occurs through perceived usefulness.

TAM was specifically designed to predict the acceptance of information systems by their users in organizations. According to Davis, the main objective of the TAM was explaining the factors that determine the use of IT tools by a significant number of users. The model suggests that the perceived usefulness and the perceived ease of use are determinants in the intention of an individual to use a system.

Even though the TAM aids IT officers to know if a technology is going to be used in an optimal way, it is necessary to identify the external variables that directly influence the perceived usefulness and perceived ease of use by users and establish the relationship that they maintain with the resulting use of technology. Orantes (2011) established that in Mexico this theory, along with other IS theories, is little known to managers that do not work at international companies. This lack of knowledge is confirmed by Fernández, Bautista, and Sánchez (2012), as they also proposed a model for public universities to start teaching this model as well as the theory of planned behavior (TPB).

The theory of planned behavior, developed by Ajzen (1991), helps understand that the behavior of people can be changed. TPB is a theory that predicts deliberate behavior because behavior can be planned. This theory derives from the discovery that behavior is not 100% voluntary, adding perceived behavioral control. This theory appears as an extension of the TRA to overcome the limitations that present when behaviors are not conscious, or beyond the control of the individual (Ajzen, 1991). To overcome these limitations, TPB introduces a new key element, determined perceived behavioral control, to provide a better prediction of both the intention of conduct the final behavior (Ajzen, 1991). The TPB remain as the fundamental concepts of TRA, attitude, subjective norm as predictors of behavioral intention, which in turn allows us to predict the actual behavior, to which the new concept is added, based on the idea that the realization of behavior is based on a combination of motivation or control behavior-capacity. Thus, it is expected that both have a direct effect on behavior, especially in circumstances under voluntary control of behavior, whereas in high-control behavior, the influence of perceived

behavioral control is expected to be minimal (Ajzen), assimilating to what was proposed by the TRA. However, this idea of interaction between the two, despite its importance, has only been tested empirically (Ajzen). Thus, the model has been frequently raised as perceived behavioral control as an independent variable that directly affects behavioral intention, encompassing parameters such as perceived ease of use and the difficulty of carrying out a particular behavior.

The application of TPB and TAM to the adoption of information systems had a major drawback, as they are based on perceptions, beliefs and attitudes, so Goodhue (1995) suggested the need to introduce elements that relate the evaluations of users with throughput that provides system usage. For this, the fit between the task and the technology (TTF) as the extent to which a particular task can be performed efficiently with a specific technology or technological system arises. Thus, the contradictions arising from the technology evaluating regardless of the task for which they are designed are avoided, while studying the perceived utility is favored by the individual, which in this case, the degree of adjustment responds between technology and task via the user experience of the individual. Moreover, they are raised on specific tasks; user perceptions allow detection of the difficulties of users with the most effective use of the measure of the perceived usefulness and perceived ease of use of the technology.

Finally, there is the unified theory of acceptance and use of technology (UTUAT). This theory arises from the need to create a common theoretical reference to retake the constructs of other theories and models such as the previously-mentioned TAM and TPB, which have proven to be useful in assessing acceptance of technology and realizing an

evolution in explaining the phenomenon. The authors of this theory formulated a unified integrated model. In this theory, there are four main factors: performance expectancy, effort expectancy, social influence and ease conditions, which are moderated by gender, age, experience and willingness to use.

Due to the limitations of TAM, it was necessary to adapt this model of technological acceptance factors from other theories of behavior, or integrate it with other models like TPB, since none of the proposed models seemed able to offer a universal approach allowing the prediction of the behavior and acceptance by users of IT-based systems. Therefore, Venkatesh, Morris, Davis, and Davis (2003) analyzed in-depth the previous models in order to find a unified model that would overcome the limitations of existing models by formulating the UTAUT.

According to Venkatesh, Morris, Davis, and Davis (2003) fundamental differences of this study with respect to previous studies based on models lie in several factors. First, the complexity of the studied technologies, as UTAUT allows acceptance analysis systems and complex technologies. Second, the sample used, within the scope of a business, in contrast to previous studies based on self-reports from students. Third, the time interval considered, since the analysis does not focus on a specific time but considers three different time instances (initial, intermediate and final) over six months. Fourth, the context of use includes both voluntary use situations and mandatory use of the system. Fifth, the organizational context is considered from samples from different organizations. Sixth and last, the study of the influence of social and demographic

variables (gender, age, experience of use and degree of voluntariness) that influence the relationship between the independent variables and the intended use.

The UTAUT was then modified by Koster (2007), who applied the model to an information system whose adoption, unlike the systems adopted by their usefulness, such as entertainment, the mere enjoyment of the service, the feeling of wellbeing that use produces, etc. The UTAUT model was designed primarily for predicting the adoption of Information Systems. Therefore, to predict the adoption of systems that are made for entertainment and other reasons other than mere utility it is necessary to modify the theory. Subsequent amendments to UTAUT, applied to the field of use of teletraining systems, have begun to add to the original model variables relating to cultural identity (Nistor, Lerche, Ceobanu, & Weinberger, 2011), or by adding elements as the basis of technological education of users (Iglesias, Hernández, Pascual, & Dueñas, 2011).

BI can be defined as a management term that refers to the applications and technologies used to obtain, organize, and analyze data and information about the operation of a company. It will then help obtain an ample knowledge of the factors that affect its performance, such as sales, production, internal operations, etc.; and therefore, with better information, managers can make better decisions. Glykas (2013) stated, "BI is a poorly defined term and its industry origin means that different software vendors and consulting organizations have defined it to suit their products; some even use BI for the entire range of decision support approaches" (p. 309). Ghazanfari, Jafari, and Rouhani (2011) indicated that BI is a combination of concepts, methods and processes that enhance business decisions by combining information from multiple sources and

integrating this data with decision “analysis tools to provide the right information to the right persons throughout the organization, with the purpose of improving strategic and tactical decisions” (p. 1580).

Shollo and Kautz (2010) defined BI not only as a solution but also as an encompassing of data, information, and knowledge, as well as the products, processes, and technologies included. Modern organizations have to obtain, understand, and master the data that helps them make decisions to achieve better results. The life cycles of business are accelerating, such that managers have to make faster decisions. It requires the right information at the right time and at the right place for managers to obtain better results than competitors do.

The concept of BI can be traced from the seventies, with the concept of management information systems (MIS), which were static and very simple; but then in the eighties the concept of executive information systems (EIS) emerged, which included dynamic, multi-dimensional features and elements of reporting, such as forecasting and analysis, amongst others. An information system contains data on the organization and its environment, which is produced with three basic activities: input, processing, and output. Feedback is output returned to appropriate people or activities of the organization to evaluate and refine the entrance. Participants of the environment as customers, suppliers, competitors, shareholders, and regulatory agencies interact with the organization and their information systems (Laudon & Laudon, 2012).

In the 1990s, the Gartner Group introduced the term BI. According to Chu and Yang (2012), intelligence was more than just retrieving information; it involves not only

the data but also its environment and the way the information was gathered. It is knowledge because it requires the involvement of a human being. Data collection produces data, and it is the human mind that converts it to intelligence in order to adapt it to a specific context for a particular individual.

Hočevar and Jaklič (2010) defined BI as "information technology that helps organizations manage business information with the goal of arriving at effective business decisions" (p. 89). Rusaneanu (2013) offered a definition of BI: "BI concept involves raw data that needs to be condensed from different sources and then transformed into information" (p. 150). Finally, Barakat (2013) defined BI as "the use of data mining, online analytical processing, querying and reporting on data warehousing to extract information needed for strategic decision making process[es] at the organizational level, thereby reducing costs and creating new business opportunities" (p. 302).

The problem lies in the implementation of such systems, and even a successful implementation might prove not as beneficial as originally thought. Unfortunately, what is good for the company strategy might not be for the implementation. If the industry as a whole adopts new information systems, it will then change the potential basis for competitive advantage. Now it is not only sufficient to have an information system but it is imperative to implement it better than everybody else is. A company may obtain an advantage by implementing their information system faster or cheaper or with more efficiency than others, perhaps achieving greater compatibility between their system and the way it needs to conduct business.

Literature Review

It is often argued that we live in the age of information. This concept is associated with that model of society dominated by the information sector, either because it is increasing the number of persons whose activities consist mainly of managing information or by the appearance of new economic sectors related to information. It is a revolution based on information, but not due to the fact that organizations and society in general have at their disposal an infinite number of data available, but because of the current technological advances. Advances that allow the transformation of such data into information and to process, store, retrieve, and communicate that information in any form, no matter the distance, time, or volume.

To understand the origin and concept of IT the development that affects these technologies should be reviewed, with particular attention to computers, computer languages, microelectronics, and telecommunications. The computer has evolved at a dizzying rate since the abacus, about 3000 BCE, through a simple machine consisting of addition and multiplication, the differences machine, to the first computer called ENIAC that began operating in 1946, which was a thousand times faster than calculators used to date. This is the first generation of computers that spans the end of the 1950s and was based on tube technology. The second generation of computers had as a pillar the solid state technology: the transistor. In the early sixties, integrated circuits resulted in the third generation of computers. Software also evolved hand in hand with the hardware. It starts with the appearance of ENIAC and programs written in machine or binary language. The next generation is called languages-oriented procedures such as Fortran or Cobol. In the

early 1960s, microelectronic chip or microchip assembly appears in a small silicon support, which is one of the main supports of the technological revolution based on IT.

The determination of benefit through the investment in new technologies has been a subject of study to both practitioners and researchers of IT. It has been clear that the implementation of systems ultimately brings benefits to the companies, as higher-ranking officials obtain a clearer and faster picture of their company, but measuring and justifying this value has not been an easy task. Companies have a lot of data throughout their organization, but very little of it is usable. Thus, they lack the actionable information and its analytical tools to really unlock such information's potential, thus enhancing the performance of the company (Deng & Chi, 2012; Hou, 2012; Işık, Jones & Sidorova, 2013; Rouhani, Ghazanfari, & Jafari, 2012). This is where an information system might help the company. The characteristics of an informational system make its application available to be spread over wide areas of activity. For businesses, information systems constitute a valid tool to optimize the use of available information and are necessary for the management of the company. The systems offer to the decision makers a systematic approach to the management problems with a quick analysis and with the information required for resolution by proposing appropriate and equivalent solutions. Moreover, information systems incorporate certain features valued by decision makers to memorize and the ability to explain, when so requested, the steps followed in solving a problem, making it transparent to the user, allowing a better understanding and as a result better utilization.

Although it is obvious that all members of a company use information to a greater or lesser extent, most of the research on the use of internal company information has focused on the study of management behavior. This is because one of the characteristics of the management of a company is to convert information into action in the process of decision making, activities performed by management excellence. There are indeed different types of information within a company. First, the information generated by the processes related to the normal management of the company, used mainly by control and operations management, originated in the reports generated for process control and supervision in the very short term and even in the daily run. Second, the internal information that originates in the previous level that would meet the needs of the strategic direction of the company, by way of summary reports aimed at informing senior management on the normal processes of company management and availability or lack of resources to meet the company's needs environment. This data would face external information in order to trace the business strategies. Finally the existence of a third type of information used within the company is based on the concept of know-how, caused by the integration of information already mentioned, the experience of the members of the company and the impact of new information technologies. It is important for managers to understand these types of information, as they are what a BI system will transport within the company and what finally brings value to the system. Therefore the BI system should be structured so that it records the necessary information on the various functional aspects of each company's levels relevant to any decision: tactical, strategic or knowledge generation; all in an integrated way in order to optimize the resources committed. The

predominant role that information and IT have achieved in the management of modern enterprises, which is based on the development of appropriate information systems interoperable with IT, has reached levels that not only aid but also affect the entire organization.

According to Gill (2013) intelligence in the corporate sector takes two forms, first there are companies that use BI to gather and analyze information regarding their products in relation to potential markets, activities, and competitors. These companies can obtain their intelligence from open sources, from their marketing departments, and some companies even have an internal economist section determining supply and demands. There are even companies that will rely on corporate or industrial espionage to obtain such information. However, there is a second area of corporate intelligence, and this is the company whose operations concern security intelligence specifically, such as private security companies. Gill established that in the United States "by 2006, about 70 percent of the intelligence budget was outsourced to contractors" (p. 94). This is important because it gives an idea of how companies in economies such as the United States perceive and appreciate intelligence. Employees of companies that do not deal directly with intelligence at least have an overall idea of what it is and how it can benefit them, contrary to those in Latin America, described in chapter one. In fact, Priest and Sarkin (2011) stated that many of the employees in private intelligence, having been trained by government, then leave for the private sector where they are paid much more, employees with a deep sense of intelligence and its culture.

Therefore a BI system of a company is one composed of people and systems as well as other physical and management means that take care of the treatment, storage and dissemination of the information received and generated in the organization at three levels: tactical, strategic and knowledge. Hočevar and Jaklič (2010) argued the usual methods of evaluating an investment such as the classic return on investment (ROI) or the net present value (NPV) are inappropriate, insufficient or unfeasible, thus there is a need for a qualitative approach. However, there is a great need for companies to implement and use a BI system; Gunther (2013) stated, "executives need a new set of strategy frameworks and practices for winning over the long haul, even as sustainable competitive advantages have become a thing of the past" (p. 5). To establish a value for BI, it must be understood how it can affect the organization and to know the benefits expected. Muntean and Surcel (2013) acknowledged that with new BI systems, information will not only be obtained from traditional accounting systems, but that they will require hundreds of internal and external data sources, including "relational, semi-structured XML, multidimensional and Big Data" (p. 119). This statement is also supported by Ivan (2014), who affirmed that BI systems should concentrate not only on the sources of data but also on its ease of use, flexibility, and data security.

Chen (2012) stated that among the benefits of implementing BI system, companies were: (a) monitor quality and improved outcomes; (b) improved workflow efficiency; (c) developed best practices; (d) uncover patterns of increased expenditures; (e) increase efficiency in planning, budgeting, forecasting; (f) enhanced human resource management; (g) better management of supply chain and logistics; (h) cost containment;

(i) manage financial performance; and (j) uncover revenue opportunities. Bergiel, Bergiel, and Bergiel (2014) considered that through the use of BI a company could identify key values that customers require and create a strategy that focuses on such values. White (2009) stated that a company might even recover from a recession and maximize its revenue, even in a low sales market, because BI systems would allow them a better control of their expenses, thus obtaining better results. According to White, in a study made by the Aberdeen Group of 250 companies it was demonstrated that those with BI technologies during a recession had a better performance than those without it. This is in accordance with Gurkov (2013), who found companies in Russia that had invested in BI solutions were affected less by an economic recession and a period of fragile economic recovery than those who did not.

Luftman and Zadeh (2011) studied the role of BI in various economies around the globe. One of the main concerns found by these authors in their study is the budget constraints of such an implementation for countries in Latin America and Southeast Asia. Because of the volatility of their economies, it is very difficult to create a reliable forecast for the company, but with the use of BI systems, it is possible. Even though BI does not bring managers something new, it does allow them to solve a problem that they have always had: to analyze a complex business environment and make a decision. BI systems allow the presentation of such information in a reliable and efficient way so users can view this information, analyze it and thus make a better-informed decision. Ruseaneanu (2013) affirmed, “BI gives companies the ability to access, analyze and use their data to make business decisions” (p. 150).

Loshin (2012) stated that among the benefits of implementing a BI system are cost reduction, increased throughput or volume, and higher profits. The author also established managers need to have in mind the true reach of the BI system and adjust such expectations accordingly, and not expect the solution to solve all the problems automatically. Târnâveanu (2012) considered that BI allows an organization to map its "strategic objectives into performance metrics in four perspectives: financial, internal processes, customers, and learning and growth" (p. 53). According to Davenport, Harris, and Morison (2013), a BI system is an important component of a modern enterprise's information infrastructure, as it contributes to success and competitiveness.

Given all these established benefits, authors have tried to establish a specific value to the implementation of such a system. Alshibly (2015) stated that it is imperative when an implementation of a new system is in place that the customers, in this case, the officers, have a clear value of what the system will bring, and contrast it to the perceived value they might expect. Also, sometimes such customers do not grasp the final benefits and this is a reason implementing a BI system is not only difficult but sometimes not even attractive to managers (Alshibly).

Elbashir, Collier, and Davern (2008) developed and tested a method to measure the effects of BI, it found that there is a positive and significant relation between business process performance and an increase in customer intelligence, supplier relations, and internal efficiency. The authors also concluded that the firm size is not relevant to the positive effect of a BI system in a company (p. 147); and that there is no significant relevance to the benefits of BI systems in service or nonservice industries, meaning that

BI is relevant to all kinds of companies. According to Hou (2012), it is very important for managers and administrators of the new BI system to understand it and the effect of such systems on their jobs. The author concluded that end-user satisfaction with the system is affected by how the system is perceived regarding each individual's responsibilities and performance.

There are several models in the business environment to evaluate the maturity of the implementation of a BI system, and according to the level of maturity the justification can be seen from different angles. Such models allow organizations to obtain a perspective on the exact status and where the BI system is going. Eckerson (2005) proposed a six-stage BI maturity model, described in Table 2.

Table 2

Six-stage BI Maturity Model

Stage	Architecture	Analytics	
1. Prenatal	Reporting	Paper report	
2. Infant	Spreadmarts	Briefing book	GULF
3. Child	Data marts	Interactive report	
4. Teenager	Data warehousing	Dashboard	
5. Adult	Enterprise DW	Cascading scorecards	CHASM
6. Sage	Analytical services	Embedded BI	

Note. Adapted from Eckerson (2005).

As can be seen in Table 2, the company grows from a parental stage in which employees and managers work with paper reports to the final stage. In this stage, the BI is in full effect and the architecture has evolved from just reporting to analytical services. This allows managers and higher-ranking officials to take better-informed decisions.

Popovič, Turk, and Jaklič (2010) proposed a conceptual model to value BI systems in which several key factors that allowed the usage of quality information in a

company were determined. The authors concluded that BI and its level of maturity does influence the IQ of a company and that a company with a higher IQ indicated better efficiency than its competitors with lower IQs.

Implementing a BI system should consider the possible types of potential users, and more importantly, its alignment with business strategy. BI should serve to change the way the company conducts its business, improving processes and making decisions based on the data and information obtained. It also must consider the type of information it will work with, both internal and external, as well as the way it will report to decision makers by using communication technologies, automation of processes and new portable informational devices like tablets or smartphones.

A fundamental aspect is to have an initial framework, which consists of planning and execution of the following functions: business, organization, functionality, and infrastructure, in the last two, it is necessary to define the strategic and operational objectives. It will have to take into account the skills of the organization and its particular culture, both internal and external factors, and will need to excite the involved teams. It will also be necessary to consider the integration of various BI projects and whether there is more than one interaction with IT and business partners. Once everything is in order to begin implementation of the BI system, it is recommended to implement a BI competency center to support the whole process.

According to Rosso (2012) there are several phases that a company must follow when thinking of implementing a BI system, shown in Table 3.

Table 3

BI Implementation Phases

	Determine business objectives
Background	Evaluation of the context (situations, problems etc.), both past and current of the company, including events or circumstances that arise and justify the need for the project.
Business objectives	Establish reliable, measurable and achievable objectives that the company wish to achieve.
Exit factors	Create an adequate understanding of the business and the information it uses and creates Have the blessing of the directors. Actual Situation
Resource inventory	Is there any type of BI system in the company What internal and external information will the system have and what kind has to be obtained. Is there enough personnel to oversee and utilize the system Are there any security concerns
Requirements	Client segmentation Sales increase Understand supply and demand for products.
Risk, assumptions	Evaluate and understand all the assumptions that are done while the implementation. Understand and list all the potential risks in an information technology implementation.
Cost and benefits	Have an original idea of the cost, as well as an estimation of the benefits to be obtained. Generate Work Plan
Initial project	Can be adapted from the suggested system made by the chosen vendor.
Requirements	Once the prototype is established re-evaluate the technological resources as well as human resources at hand for the project.

Note. Adopted from Rosso (2012).

Many companies fail to specify organizational objectives when deploying an information system. Consciously or unconsciously, they separate the field of IT from the field of structure and organizational change. In the past, when almost no system was attributed to a specific organizational model, such separation was not a problem.

However, currently the integration and scope of informational systems almost force the companies to adopt new ways to organize. Functional boundaries in the organization that uses the information system lose importance in favor of cross-functional coordination. The culture to do business or to report them becomes more difficult and demands teamwork skills.

Perhaps the most common problem in the initiatives of organizational information systems is the failure to obtain a higher organizational integration level. Information systems exist to support companies that wish to be integrated across functions and business units. However, the system alone is unable to produce such integration, and many organizations do not take the necessary steps to achieve the level of integration they seek. Achieving integration of processes and information requires a high degree of organizational change.

With the integration of different areas, even in developing countries, there are advantages to an implementation of a BI system. Linares (2012) established that some advantages in countries like Mexico are "the strategic orientation of the organization for a correct decision making process, elevating the possibility of insertion of a new product in a market and allowing the feasibility of such insertion before official launch of the product" (p. 54).

Among the barriers that BI systems implementation confront, one of the most common is also related to all IT systems, the idea that the implementation of such a system will resolve all problems for the managers. However, these systems are only tools that automate functions, such as sales force, client management, income, and expenses,

among others. Another barrier is the cost, even more so in developing countries, where the monetary parity difference is a big decision factor for managers. This cost also constitutes a barrier when the budget of implementation is not calculated correctly, and the system costs more than originally planned.

An important barrier related to the implementation of the information system represents the goal of creating a more disciplined culture in the company around the information, processes, and systems. Companies that adopted this goal in the past generally held a position of not interfering, allowing the personnel to follow their favorite approach. The result is usually the proliferation of different systems and ways of carrying out the work, each with its information. Companies find that some system users and managers are pleased with this approach, but it results in a great difficulty integrating the functions and business units. Also, it can be very expensive to build and maintain this kind of IT environment because the basic functions are repeated in various parts of the company.

An overlooked barrier in some companies is the lack of user confidence and buy-in in the system. It is important for companies to train their employees in the solution and provide a feedback-rich environment. IT must allow users to set the rules and usage of the systems, so these users experience firsthand the benefits of the implementation. Another barrier is when companies ignore the technology requirements for a BI implementation, and then add the cost of this new technology to the system, misrepresenting the real cost. An implementation of an information system has a major impact on the management culture of the companies that adopts it. The big change that

causes the information system is that other managers can obtain information about the company and its operations. It is easy to see how a culture of greater responsibility can develop.

It is highly recommended that the planning process of an implementation of a BI is done to the fullest extent possible and is always aligned with the business strategies. The greatest risk in not doing so would be an over-investment in technology that does not yield the expected benefits or that the results are marginal, resulting in a situation as bad for business as it was not using technology tools to support business processes. The net result would be a lack of competitiveness and consequently lost market share and eventually the demise of the company.

It is important to note that BI is perceived very differently in Latin American countries than in developed countries. According to Holzmann (2005) during the twentieth century governments in Latin America used their intelligence services as a military tool to identify and neutralize possible opponents to the government in place. The acquiring and retaining of information was a vital part of agents' ascending the political sphere. This affirmation was also noted by Ugarte (2001) when he established that the military intelligence organisms of the Latin American dictatorships in the early 20th century established the base for the creation of the state intelligence agencies, which were later abused and redesigned into new agencies. It is important to note that the intelligence agency in Mexico is called the National Center for Research and Security and according to its former director, Jorge Carrillo, it is no coincidence that the Mexican intelligence agency does not have the word intelligence in its name. It was designed that

way, so there would be no negative connotation toward the agency because of the word intelligence (Montenegro, 2013). This organism, CISEN by its letters in Spanish, is a body of civil intelligence at the service of the Mexican State whose purpose is to generate strategic, tactical and operational intelligence that preserves the integrity, stability and permanence of the Mexican State, giving support to the governance and strengthening the rule of law. Its main objective is to alert and propose measures of prevention, deterrence, containment and neutralization of risks and threats that seek to undermine the territory, sovereignty, constitutional order, freedoms and democratic institutions of the Mexican population and economic, social and political development. In fact "anthropological and ethnographic research on violence in Latin America reveals that many citizens living under conditions in which failing state institutions cannot provide adequate protection do not necessarily consider the use of violence as a means to an end illegitimate" (Landman, 2010, p. 231).

Siffa et al. (2011) established that for countries in developing economies, such as Mexico, language and cultural barriers when selecting a foreign supplier for a new IT contractor are the most critical factors. Among other factors found by these authors were: (a) country instability; (b) the lack of protection for intellectual property rights; (c) lack of project management; and (d) lack of technical capability. The authors also cited that these cultural barriers might be a definite factor when selecting a company and that companies invested in BI solutions should hire some local expertise to localize the solution.

One of the main obstacles in implementing any system is the organizational culture. Davenport and Klahr (1998) stated that modeling the organizational culture is the most important element when a company is trying to effectively manage its information. It is only through an amicable organizational culture, one in which every idea is considered and taken into account, that a system that will ultimately aid in the BI implementation and use. According to Montenegro (2013), in Mexico it is not only necessary to adapt the internal organizational culture of a company for a new implementation of a BI system designed for a highly functional working environment, but it is also required for employees to understand a complete new way of working and interacting with their coworkers.

In Mexico, CEMEX noted that it was important for their employees to adapt to a new organizational culture that allowed them to keep growing. According to Robles (2005), in 2003 CEMEX established a model for its employees in which its main concept is "1+1=3". This concept establishes that the whole (3) is greater than the sum of its parts (1+1), emphasizing the importance of the learning of each individual plus the experience gained by teamwork, actions that result in a multiplier effect of each experience and in turn increase the potential for CEMEX. The best evidence for this strategy is the increase in sales; in 2004 CEMEX sold 14.4% more concrete than the previous year, evolution that situated CEMEX as the third largest cement producer worldwide. Robles also established that CEMEX implemented a technological platform called CEMEX WAY that allowed the company to save over 120 million pesos per year by reducing the IT costs to 1.8% of the total sales. This platform also allowed the company to standardize

the supply process and saved 5% of the cost of purchase; and finally the system permitted a reduced time in the integration of the purchase of a new company called Cementos Tolteca.

BIMBO Enterprises established a program titled “Evaluacion y desarrollo de proveedores BIMBO” [Evaluation and development of BIMBO providers] (Ruvalcaba, 2014), which allowed the company to strengthen its own products by developing and measuring their providers’ productivity and the market trends, being first in launching innovative products in Mexico. Its system allowed BIMBO to have a better integration and synchronization of processes in the chain of supply and alignment of internal business processes between areas and companies. The program also improved profitability in production, logistics and transportation of products; it allowed BIMBO to have less stock throughout the supply chain; an improved customer service with less breakage of product; a standardization of the different levels of allowances, trade, logistics, and production in a single centralized system.

According to Simeon (2002), in developing countries the application of IT tools is poor. There are some cultural deficiencies, such as resistance to change and the scarce innovative culture. There are also organizational deficiencies, such as non-integrated corporate structures, and little infrastructure to support IT operations. Simeon also stated that there are management deficiencies in companies in developing countries, such as the inability to establish methodologies to detect opportunities and threats in the environment and the confusion between a BI system and industrial espionage. Ejiaku (2014) also affirmed that because of the nature of the economy in such countries “most developing

countries have ineffective IT policies and this has created problems in the growth and application of IT" (p. 60).

There is always a risk in implementing a BI solution in advanced economies; in fact, according to Goodwin (2011) between 70% and 80% of corporate BI projects fail. Most of these failures are attributed to the following mistakes that managers need to look out for when managing an implementation (Information Builders, 2013). First is buying what analysts want without considering other users; this is that managers only listen to the business analyst and perhaps the financial advisor when deciding which system to implement, but managers must also listen to the business users of the system as well as those in strategic, tactical and operational levels. Another big mistake is implementing a new data warehouse without training people to forget the classic worksheet and work with new type of information. Because of the popularity of spreadsheet software, many companies now rely upon these worksheets to analyze their data, and when a new data manager solution is implemented users have a very difficult time getting used to the new visualizations and end up returning to the spreadsheets. When implementing a BI system, sometimes managers are pushed by a specific user to select the BI system that has a unique feature that eases his job, but does not fully guarantee that the system will be easily deployable to the rest of the company.

The lack of a concrete data quality strategy is also one of the reasons for a failed BI implementation; this is to ignore the quality of the information that will be used by the BI system in order to rush an implementation. Both internal and external information and its quality must be considered before such an implementation. Today the use of mobile

devices in corporations is a given fact, but sometimes BI systems do not contemplate them. Nowadays there are still some systems that heavily rely on a full screen and a complete physical keyboard to operate, and it might even be good at the beginning when the system is new, but in the long run there will be more mobile devices than desktop computers to obtain and process data. Finally, managers must be cautious when deciding which information and which operators will be using the BI system. Sometimes departments might only consider and relay to the managers the current information they are using but sometimes overlook what future data might look like. The incorporation of social networks, as well as new forms of communications, must be included in the BI implementation analysis.

The term research, when applied to social sciences, specifically connotes creating knowledge about the reality, the changes in the whole system of experiments, and the changes in their components. In this sense, a researcher can be considered a seeker of knowledge, regardless of his or her methodology, purpose, or importance. Humans have a natural tendency to search for the reasons for events; therefore, there are many varieties of research, from the most elemental, in which the objective is to expand the horizon of the known objects, to the scientific research, with its own characteristics of superior efficacy.

Social research, as a scientific practice, implies a longer and more complicated road, given its individualities. It begins with the socialization of the investigator in the first precedents of a determined paradigm and then later explained in one or more central theories, as well as a methodological system of rules and research techniques that the

researcher must know. According to Johnson and Christensen (2000), "there are currently three major research paradigms in the social and behavioral sciences, quantitative research, qualitative research, and mixed research" (p. 9). Each of the paradigms is defined by the type of data gathered and used, and may be quantitative, qualitative or a combination of both types of data.

In social research, the qualitative methodology is a diversity of approaches that all merge to answer a specific question. There is no unique way to define qualitative methodology. This diversity of options is a result of the nature of each methodology used, as well as for the diversity of the paradigms, models, and procedures that sustain it. There is no unity in what they are and how these qualitative methods are operationalized.

Qualitative methodology is about an open-ended search for knowledge related to the truth of human beings and their behavior. It implies a commitment between people and their interactions and a constant negotiation of such interactions. Some of the qualitative research designs are action research, grounded theory, and case study.

To understand the methodological characterization of a research, it is necessary and convenient to investigate its epistemological base in such a way that we can find the purpose of its procedures to generate scientific knowledge. Following this argument, the approach of the research methodology in the social sciences area is used to discover what *lenses* have been developed to examine different realities that compose the order of the human being, as well as to comprehend the logic of the ways that they have been built to produce intentional and methodical knowledge about them.

These methods, regardless of their methodological differences, share the following characteristics: data processing is done with a higher regard for quality than for quantity, through the study of language, detailed descriptions, codification processes and categorization; the search for a holistic comprehension of a given event, seeking a wider perspective rather than minute details; and a tendency to totality. The process follows an inductive pattern, from data to theory, even when some parts of the process may be deductive.

Qualitative research is a continuous process of evolution, with the development of new methods of investigation that are constantly being adopted by researchers in various fields of study. Therefore, qualitative research involves social and subjective realities of high singularity and dynamism; thus, the resultant knowledge creation cannot be universal, absolute or definitive. It implies a permanent critical attitude and is also dependent on the principles of the researcher, of a high dominance of the theory, and the historic context in which the studied reality is produced.

The selected method for this dissertation was phenomenological. The purpose of phenomenological research is to describe how specific phenomena of interest are lived and experienced by individuals. The focus of phenomenological studies is on understanding what experiences can be represented within the context of life of the people, which is referred to as capturing the lived experience. Although the research interview may not lead to objective information, it captures many of the subjects' views on the problem or situation being researched. Schütz (1976), considered as the person who brought phenomenology to the social sciences, affirmed that "the object [of

phenomenology] shall be studying at the human being who is looking at the world from within the natural attitude" (p. 97). This means that the researcher must deeply understand the phenomenon that the participant is experiencing, and this is done through interviews that can become extensive. In fact, Schütz also emphasized that it is important in phenomenology to have clear communication skills, as it can be a means or an obstacle to understanding what the participant is trying to convey.

Regarding the reality that is being researched, it is important to recognize its complexity; events and related factors have multiple addresses and are always in flux. That is, there are no univocal cause-effect relationships; elements that at one time interrelate might not in another time or may be accompanied by other factors altering such relations. This is important because participants must have appropriate time to express themselves and identify these relationships.

There is reluctance amongst phenomenologists to establish a specific methodology for phenomenological research. As stated by pioneer phenomenologist Keen (1975), "phenomenology cannot be reduced to a cookbook set of instructions. It is more an approach, an attitude, an investigative posture with certain set of goals" (p. 41). And in accordance with the ideology of this type of research in which the main objective is not generalized any findings, but to illuminate human phenomena (McKinney (Ed.), 2013), it is important to note that the number of participants in the study might be limited in size, differing from other qualitative methodologies. However, it is also very important to note that saturation, as explained in the next chapter, will be a factor for determining the number of participants for this study.

With qualitative research interviews, the researcher tries to understand something from the subjects' points of view and to uncover the meaning of their experiences. According to Kvale (1996), the qualitative research interview will provide information that aids in describing the meanings of central themes in the life and world of the subjects being researched, seeking to cover both a factual and a meaningful level. There is no common procedure for research interviews, but an interview investigation can be outlined in six method stages: thematizing, designing the study so it addresses the research question, the interview itself, transcription analysis, verification and reporting. Kvale (1996) also remarked, with regard to data capturing during the qualitative interview, that it "is literally an interview, an interchange of views between two persons conversing about a theme of mutual interest," where the researcher attempts to "understand the world from the subjects' point of view, to unfold meaning of peoples' experiences" (pp. 1-2).

The purpose of the qualitative research interview is to obtain descriptions with respect to interpretations of the meaning of what is described. The interviewer does not use ready-made categories but is open to new and unexpected phenomena. Interviews can be free of bias and provide objectivity and mechanically measure reliability by the degree of agreement among independent observers.

The qualitative interview is defined as an ordinary conversation, with some specific characteristics. Anyan (2013) defined it as "a dialog between uneven partners in a specific hierarchical form of conversation where the interviewer sets the rules of the game" (p. 6). Also, these characteristics are precisely what differentiate an interview from an ordinary conversation. Even when most manuals insist on the ideal of the

interview as a more or less ordinary conversation, a different social situation is generated beyond what may be considered ordinary, for both the interviewer and the participant.

The difference between the interview and an ordinary conversation is at the pragmatic level. An ordinary conversation may have multiple pragmatic senses, but the main pragmatic level of the interview lies in the research. It is a talk to be observed; as such, the most important methodological part of the interview is that the researcher finds approximations to the experiences of the subjects, especially when the hypothesis is about a conflict amongst norms. On one side, dominant norms, referential, are usually reproduced in the organization because they confirm what is legitimized and what needs to be said. On the other hand, there are practical norms reproduced in the practice.

The interview may also be viewed as a "conversational meeting with at least one other self" (Skinner, 2012, p. 6). It requires a confession from the participant in its practice experience, even when such experience is established as a different norm from the one that may be more legitimized. If in the standard interview the relationship to what is legitimate is by adscription, in the open interview it is by discursive interiorization. Even in those researches that may use the interview only to obtain the opinions of the individuals, what is really at work is a social situation that demands a confession rather than an opinion, which is qualitatively different, given that this arises from the confrontation of a discursively dominant norm and the particular norm.

Kvale (1996) identified seven stages of the qualitative research interview: (a) establishing the theme, to formulate the purpose of the investigation and describe the concept of the topic to be investigated; (b) designing, to take into consideration all seven

stages, i.e., the complete research plan, before the interview begins; (c) interviewing, to conduct the interviews based on the interview guide and with a reflective approach to the knowledge sought; (d) transcribing, to prepare the interview material for analysis, which commonly includes a transcription from oral speech to written text; (e) analyzing, to decide which method of analysis is the most appropriate; (f) verification, to ascertain the generalizability, reliability, and validity of the interview findings and finally, (g) reporting, to communicate the findings of the study and the methods applied in a scientific form, taking the ethical considerations into account, and writing a final report.

There are a great number of studies for implementation of BI systems in advanced economies. Specialized BI websites and BI solutions providers' webpages such as businessintelligence.com, pentaho.com, informationbuilders.com, and informationmanagement.com have a large amount of white papers and publications. Most of these are case studies on the challenges and success factors of implementing their technology.

There are very few studies done in developing countries. Among the quantitative studies is Keelson (2012), who analyzed through correlation the association between antecedents of market orientation components and BI of firms. Another quantitative study was made in Romania in which there was a correlation between farm productivity and information technology adoption (Moga, Constantin, & Valentin, 2012).

Most of the studies regarding the implementation are qualitative; for example, Chen (2012) analyzed case studies of the outcomes after an implementation of a data warehouse and BI tools within healthcare organizations and concluded that indeed there

are benefits, but managers are rarely aware of them. Olszak and Ziemba (2012) identified critical success factors for implementing BI in small and medium enterprises in Poland through interviews in small and medium enterprises. Yeoh, Koronios, and Gao (2007) also did a qualitative research through interviews to detect critical success factors of implementing a BI system in Australia.

Following the literature, it is clear that only through a qualitative research methodology can the factors, or in this case, the barriers are identified. No research done in Mexico was found regarding the implementation of BI. Therefore, a qualitative method will add to the body of knowledge by providing a fresh perspective from another developing country.

Summary

The idea of a general systems theory introduced by Bertalanffy (1972) emphasized the consideration of the organism as a whole system but formed by several different parts that may act individual. In other words it is a system of components that interact with its environment, analyzing the interconnections between the elements and how all of them together act in synergy as a simple being. The general systems theory aided the development of other theories such as set theory, in which closed and open systems can be collected into a set, in other words, a collection of systems, and the theory of graphs that prepares related structures represented in a topological space, which can be applied in biology.

Senge (2006) established systems thinking as an evolution to the general systems theory. Its foundation is that even though we observe elements of a system individually,

the conjunction of its parts is much larger. It is based on systems dynamics, and is highly conceptual; it provides ways to understand business in terms of particular kinds of repetitive interactions or archetypes. However, systems thinking is not intended as a simple tool but rather to provide a new mental model for organizations (Senge, 2006); it should not merely be a tool for solving practical problems, but it should also aim to change the individuals.

The use of systems theory is ample and applies to BI in many ways. A clear example is the socio-technical theory, developed by Trist; this theory considers that the objective of optimization can be achieved only if technological and social subsystems adjust to its environment. In other words, it is only attainable through the interaction of a human with a computer (the use of BI). It is understood by managers that what a company has to have to be better prepared than their competitors is an integrated structure of information and personnel that works as a whole, as well as a system that manages such information, allowing it to be used, reused, and constantly renewed by the members of the organization. This is in part what system thinking is about, and finally, it is the ultimate goal of a BI system.

Conner (1991) stated that because resources based on knowledge are harder to imitate and are socially complex, heterogeneous foundations of knowledge and abilities in companies are the primary determinant of the competitive advantage and superior company profitability. According to Conner this knowledge is integrated and carried better with an employee inside the company with his knowledge of organizational culture, routines, et cetera, thus creating a competitive advantage to the company because

this resource would be the hardest to imitate. Thus a cycle begins in which the more the organization learns, the more that it can innovate, and the more potential and current resources can be generated, thus creating the ability to produce more goods and services on the market, bringing the organization higher revenues than its competitors. As they reach such organizational knowledge, it will provide a new learning experience, and the cycle starts again.

Besides the technological view of the BI systems origins, there is also the human side. The theory of administrative behavior postulated by Simon (1947) stated that even though the manager of a company is a rational man, he might not have enough abilities by himself to make better decisions, thus the need for a system to aid him in the matter. Therefore, according to the theory, managers in higher positions will make a decision about *what*, this is what should be done, and employees in lower positions will make a 'how' decision. Using a BI system both employees and managers can corroborate and work to bring the *what* and the *how* decisions together.

Related to how the users of a new technology might accept it and start using it, the technology acceptance model (TAM) is used. Developed by Davis (1989), this model emerged from Ajzen and Fishbein's (1980) theory of reasoned action (TRA). TRA is based on the assumption of conscious control of the subjects before their social behavior, so that the execution of any action, behavior, or conduct is done through a conscious process. In TRA, behavioral intention is the key to human behavior element, since it is directly related to the decision not to run a particular action, and is, therefore, the most immediate determinant of any conduct, defined as the probability opinion of the concrete

and specific embodiment of conduct. For Ajzen and Fishbein, behavioral intention is determined by two main components that determine the performance of a behavior: first is an attitudinal component or personal factor behavior based on beliefs and attitudes toward the behavior called the attitude toward the behavior is defined as the learned predisposition to respond to an object in a favorable or unfavorable. Second, a component based on normative beliefs or social factor, and defined by specific social contexts, is called the subjective norm. The subjective standard includes a person's perceptions about different social pressures they are subjected to by their environment in relation to the object.

Due to the limitations of TAM, it was necessary to adapt this model of technological acceptance factors from other theories of behavior, or integrate it with other models like TPB, since none of the proposed models seemed able to offer a universal approach to allow the prediction of the behavior and acceptance by users of IT-based systems. Therefore, Venkatesh, Morris, Davis and Davis (2003) analyzed in-depth the previous models in order to find a unified model that would overcome the limitations of existing models by formulating the UTAUT.

Business Intelligence (BI) can be defined as a management term that refers to the applications and technologies used to obtain, organize and analyze data and information about the operation of a company, which might help obtain an ample knowledge of the factors that affect its performance, such as sales, production, internal operations, etc. BI is a set of tools focused on management through the delivery of precise and usable information in an optimal time in order to aid the decision-making process of managers.

The main objective of a BI system is to allow expedited and easy access in an interactive way to a diversity of data and allow it to be manipulated and transformed for managers to be able to make a better informed analysis and, therefore, a better decision. BI also is a process that consists of methods that organizations use to develop applicable information or BI, enabling the organizations to succeed in a highly competitive and globalized world.

BI systems offer a great variety of benefits for companies, including cost reduction, higher income, production and sales forecasting and problem detection. By the use of these tools, it is possible for employees and managers to create reports and respond to questions that arise during normal operations. Modern organizations have to obtain, understand, and master the data that helps them make decisions to achieve better results. The lifecycles of business are getting faster, so they have to make very quick decisions. It requires the right information at the right time and at the right place for a manager to obtain better results than his competitors.

According to Hočevar and Jaklič (2010) the usual methods of evaluating an investment such as the classic return on investment (ROI) or the net present value (NPV) are inappropriate, insufficient or unfeasible, thus there is a need for a qualitative approach. But to really establish a value to BI, it has to be understood how can it affect the organization and the expected benefits must be known to value the result correctly. Callender and Danzing (2007) stressed that this requirement of information goes beyond the day-to-day accountant information or even the company's customer management systems; it reaches the whole company, including marketing and even operations.

Among the benefits expected of an information system regarding the primary activities of a company are that it can bring added value on internal logistics, by developing link systems between the company and its suppliers, reducing warehouse costs, emergency stocks, maintenance cost of merchandise in warehouses, as well as inventory loss. In external logistics, an informational system can allow the company to understand better and faster the demand for their products and their shift in demands. Even in post-sale services an informational system allows managers to see and understand where their products are filling demands and where they are failing at it.

Chen (2012) stated that among the benefits of implementing BI system, companies were: (a) monitor quality and improve outcomes; (b) improved workflow efficiency; (c) developed best practices; (d) uncover patterns of increased expenditures; (e) increase efficiency in planning, budgeting, forecasting; (f) enhanced human resource management; (g) better management of supply chain and logistics; (h) cost containment; (i) manage financial performance; and (j) uncover revenue opportunities. Foody (2009) stated that in a volatile economy, such a scenario is common. In developing countries like Mexico, it is very difficult to create a reliable forecast for the company, but with the use of BI systems, it is possible.

There are in the business environment several models to evaluate the maturity of the implementation of a BI system, and according to the level of maturity, its justification can be seen from different angles. Such models allow organizations to obtain a perspective on the exact status and where the BI system is going. Popovič, Turk, and Jaklič (2010) provided another conceptual model proposed to value BI systems in which

several key factors that allowed the usage of quality information in a company were determined. The authors concluded that BI and their level of maturity do influence the IQ of a company and stated that a company with a higher IQ indicated better efficiency than its competitors with lower IQs.

There is always a risk in implementing a BI solution in advanced economies; in fact, according to Goodwin (2011) between 70% and 80% of corporate BI projects fail. Most of these failures are attributed to the mistakes that managers need to look out for when managing an implementation (Information Builders, 2013).

The lack of a concrete data quality strategy is also one of the reasons for a failed BI implementation; this is to ignore the quality of the information that will be used by the BI system in order to rush an implementation. Both internal and external information and its quality must be considered before such an implementation. Today the use of mobile devices in corporations is a given fact, but sometimes BI systems do not contemplate them. Nowadays there are still some systems that heavily rely on a full screen and a complete physical keyboard to operate, and it might even be good at the beginning when the system is new, but in the long run there will be more mobile devices than desktop computers to obtain and process data. Finally, managers must be cautious when deciding which information and which operators will be using the BI system. Sometimes departments might only consider and relay to the managers the current information they are using but sometimes overlook what future data might look like. The incorporation of social networks, as well as new forms of communications, must be included in the BI implementation analysis.

Among other barriers that BI systems implementation confronts, one of the most common is also related to all IT systems--the idea that the implementation of such a system will resolve all problems for the managers. But these systems are only tools that automate functions, such as sales force, client management, income, and expenses, among others. Another barrier is the cost, even more in developing countries, where the monetary parity difference is a big decision factor for managers. This cost also constitutes a barrier when the budget of implementation is not calculated correctly, and the systems cost more than originally planned.

There are many implications in establishing a BI system in countries like Mexico. It is important to note that BI is seen very differently in Latin American countries than in developed countries. According to Holzmann (2005) during the twentieth century governments in Latin America used their intelligence services as a military tool to identify and neutralize possible opponents to the government in place. Siffat et al. (2011), on the other hand, established that amongst the limitations for the implementation of a knowledge management system in Latin American countries is the language barrier.

Another obstacle is the organizational culture of Mexican companies. Davenport and Klahr (1998) stated that modeling the organizational culture is the most important element when a company is trying to effectively manage its information. According to Montenegro (2013), in Mexico it is not only necessary to adapt the internal organizational culture of a company for a new implementation of a BI system designed for a highly functional working environment, but it is also required for employees to understand a complete new way of working and interacting with their coworkers. CEMEX established

a program called “1+1=3” prior to establishing the BI system, and BIMBO enterprises established a program titled “Evaluation and development of BIMBO providers,” which allowed the company to strengthen its products by developing and measuring their providers’ productivity and the market trends, being first in launching innovative products in Mexico.

Regarding the research method, qualitative methodology is about an open-ended search for knowledge related to the truth of human beings and their behavior. It involves social and subjective realities of high singularity and dynamism; thus the resultant knowledge creation cannot be universal, absolute or definitive. The selected method for this dissertation was the semistructured interview, which provided information that aided in describing the meanings of central themes in the life and world of the subjects being researched, seeking to cover both a factual and a meaningful level.

Chapter 3: Research Method

Using and implementing IT systems in Mexico is scarce; insufficient information exists regarding how to successfully implement a BI system in a Mexican company. In fact, only a couple of documented cases have been successful, CEMEX and BIMBO. Both cases are indeed Mexican companies, but they also are international organizations that sell their products worldwide.

Through a phenomenological qualitative study, I explored the perception of Mexican CEOs regarding the challenges and implications of the implementation of such a system. By examining the thoughts of CEOs, I discovered the thoughts and perceptions of such officers regarding the mentioned IT tool. The results of this study can be used to enhance current IT implementations in Mexican companies, as well as aid in countries with a similar cultural and social background.

Understanding these factors will provide a foundation for future studies in Mexico and countries in Latin America. It will also deliver strategic information to executive officers that they can apply to their enterprises and attain a successful BI implementation. With the understanding of how current CEOs think of IT implementations, current students will have access to current managing techniques of Mexican CEOs.

This chapter is organized as follows: I first present the research design and its rationale; I then explain and justify them, after which I present the research questions. I then discuss the role of the researcher. Next, I address the methodology, the participant selection logic, its instrumentation, the procedures for recruitment, participation and data collection, sampling size, and sampling strategy. Then, I define data collection and

analysis procedures. I conclude the chapter by addressing the issue of trustworthiness of the study, detailing threats to the validity of the research, which in a qualitative design are described as credibility, dependability, confirmability, and transferability, and the way they are confronted.

Research Design and Rationale

The phenomenological subject of this study can be researched through a qualitative methodology. Qualitative research "explore[s] the behavior, feelings and experiences of people and what lies at the core" (Holloway & Wheeler, 2013, p. 3). Qualitative studies are used both in evaluation and research studies. In other words, the numbers and statistics of a quantitative study are usually replaced by a rich narrative description. In recent years, computer software designed to quantify the qualitative data without sacrificing the richness of analysis has been developed. The qualitative methodology is well suited to study particular situations in depth, where it is required to study in detail the relevant subjects. The source of information is rich in the sense that much can be learned from the examples used in the study as valuable information can be found in cases where people have had success or learned the lessons from those who have not. The subjects in a qualitative study can be a person, an event, a program, a social group, an incident judgmental, family or community.

This qualitative methodology assumes that knowledge surges from the interaction between the researcher and the researched, where values influence the creation of future knowledge. The inquiry is guided via a structured emergent design from the findings that are realized during the development of the research, and the validation of the obtained

conclusions is done through dialog and interaction. The qualitative researcher is sensible to the effects that he may produce on the subjects of the study and is trying to understand them within its framework. The qualitative paradigm seeks to describe unity in depth, in detail, based on the context and complete manner, while the quantitative method has specifically what is to be researched based on certain expectations set by the researcher. Depending on the evaluator or researcher, it emphasizes more individualized results. Qualitative evaluation tends to be done with a small number of subjects, which are discussed in depth.

Given these factors the qualitative methodology was chosen. Through a phenomenological tradition, as it sought to find out how the collectivity, in this case, the group of CEOs, made sense of BI and the reasons behind the lack of implementation of such systems in their companies (Patton, 2002). It is important in phenomenology research to analyze not only the perspective of the researcher (Churchill, 2012), but to understand how the researcher achieves a third-person view of the phenomenon through the views of the researched.

The phenomenological method does not emerge from designing a theory, but from the known world, which makes a descriptive analysis based on shared experiences. Signals are obtained from the known world to interpret the diversity of symbols. From there, it is possible to interpret the social processes and structures.

The emphasis is not on the social system or the functional relationships but on the interpretation of the meanings of the world and the actions of individuals. These epistemological notions induce the use of qualitative research methods. The

phenomenological method may be particularly useful for the study of particular events and processes; to make sense of phenomena and intent of activities.

However, far from elucidating whether it was a structure of thought to get to the truth, different authors concluded that the representation of phenomena is subject to the researchers' thoughts. The philosophical dilemma was to give scientific character to the subjectivity of thought; thus, it would reject the tenets of empirical realism and lay the foundations of positivism. However, to understand the subjectivity of the thinking there was no scientific structure that defined these concepts to make them real. Thus, they were considered empirical.

Husserl (1998), in this sense, tried to explain and justify that science appeals to the psychological characteristics of the human species (specifically his mind), and used mathematics as an example; its reasoning was to analyze the scientific structure of the human mind. The author concluded that the psychic laws were due to brain functioning and, therefore, were a purely physical and tangible axiom, and thus true and scientific. He further argued that phenomenology is the science that seeks to discover the essential structures of consciousness.

Heidegger (2010), on the other hand, stated that phenomenology emphasizes the science of phenomena. It allows seeing what is displayed, as shown by itself; consequently, it is an objective phenomenon. In another context, Husserl (1998) considered it as a philosophy, an approach, and a method; likewise, it emphasizes reflexive intuition to describe the experience as it is lived and, from his point of view, all distinctions of our experience must be free of presuppositions and prejudices. Instead, the

researcher must look for the theoretical foundations that create a secure base to describe the experience and get the real world as it is.

Heidegger (2010) referred to it as an interpretation, an explanatory clarification of the meaning of being, a historical world where the fundamental dimensions of all human consciousness are historical and sociocultural and are expressed through language. It is also mentioned that people are a being in the world, but not only a physical world: it includes their relationships with other people.

In conclusion both authors Husserl (1998) and Heidegger (2010) defined phenomenology as the study of phenomena (or experiences) as they are presented and the way that people experience them. Phenomenology is an ideal method to investigate; it reflects a philosophy and a paradigm and offers a huge range of possibilities to explore human behavior.

Moustakas (1994) is recognized as one of the main developers for a design methodology for phenomenological studies. This research was based on his design, which is confirmed by the following methodological structure. First the researcher must prepare for the data collection, for which it will be necessary for the researcher to address the question and define its terms; review the literature and determine the nature of the study. Then the researcher must develop a criterion for selecting participants and then establish contact to obtain the informed consent, ensure confidentiality, agree on the place and time of the meetings and obtain the permit to record and publish; and finally develop the questions and guidance required for the phenomenological research interview. In a second phase, called the collection of data phase, the researcher must

participate in the process of epoché as a way to create an atmosphere and relationship that allows the proper conduct of the interview; specify the question; conduct qualitative research interview to obtain the descriptions of the experience through an interview. For a third phase used to organize, analyze and synthesize the data, the author suggested using other methods, such as Van Kaam or the Stevick-Colaizzi-Keen to develop textual and structural descriptions. Finally, a final phase summarizes the study and relates the findings of the study and differentiates it from what was found in the literature; and relates the study to potential future investigations.

In the method proposed by Van Kaam initially it appears the word 'expression' can be better understood as text or thought, while the words 'time of the experiment', also from van Kaam, are equivalent to any phrase or group of phrases that have a well-defined sense. Such moments of experience, with their own sense when taken out of context, are denominated constituents or descriptive constituents. Common relevant constituents to various experiences (i.e., constant on account of the different participants) receive a common label (in other words, are the themes or essences found for the phenomenon). This method has five well-defined steps. First, the researcher must get a core of common experiences; this can be done through the interviews. Second, the researcher must list and prepare a rudimentary preliminary grouping of each expression displayed by the participants. Third, the researcher must enter the reduction and elimination stage in which he tests each expression with respect to two requirements: (a) Does it contain a moment of experience that could eventually be a necessary and sufficient constituent of the experience? And, (b) if this happens, it is possible to abstract

this time and label it, without violating the formulation presented by the participant? Expressions that do not meet these two requirements are eliminated. Concrete expressions or vague terms are reduced to be more accurately descriptive. Next, through attempts to try to identify the descriptive constituents, all relevant common constituents are joined in a core that is labeled in a more abstract way to express the common theme. Finally, an identification of the descriptive constituents by application must be done. This operation is to assess the constituents identified by attempts against random sample cases to see if they meet the following conditions. First, can it be expressed explicitly in the description? Second, can it be expressed explicitly or implicitly in some or most of the descriptions. Third, can it be compatible with the description in which it is not expressed. Forth and lastly, if the description is incompatible with a constituent, it must prove that it is not an expression of experience under study, but some other experience in which there is no explicit interest.

There are a number of authors that recently have been furthering the research on phenomenology, such as Walsh (2012), who defended evidence-based phenomenology. Walsh stated that in this type of research, the researcher must always be able to first identify the evidence through the process of the research, but also this evidence must be used to advance in an argument.

To understand this, the following research questions were constructed to address the purpose of the study:

RQ1: What are the main reasons stated by CEOs as the cause for the lack of implementation of a business intelligence system in a small- to mid-size companies located in Mexico?

RQ2: What are the challenges CEOs of small- to mid-size companies in Mexico confront when trying to implement a new business intelligence system?

The goal of the study was to explore the reasons behind the lack of implementation of BI systems in Mexico. To understand the differences that CEOs perceive and confront when dealing with new technologies, as well as to compare such views with the TAM, the TPB and the UTUAT will be used. The study was exploratory in nature by understanding how CEOs confronted the challenges and identified such challenges when a new technological system can be implemented in their companies. This goal was researched with the different contexts of how employees in developing countries, specifically in Latin America, as seen before, face the cultural background of what intelligence is and how can it be used, as well as the barriers listed before.

Role of the Researcher

As an observer of this study, I conducted the interviews. Because I currently work as a corporate vice-president in a medium sized company in the city, I believe that the CEOs were more candid because they knew that I might understand them and their needs. It is imperative to have in mind that some officers did not really know about BI and how it works, and it also might have affected their answers, as they would not like to be seen as not knowing. To address this in the letter that was sent to CEOs in the region an explanation was made as to the extent of the interview as well as the subject, trying to

limit those who might feel intimidated to not answer such a letter for the interview. Nevertheless, when during the interview some CEOs still had doubts as to the meaning of BI, or any of its components and benefits, a brief explanation obtained from the literature review was presented to the participant.

Because I only interviewed CEOs obtained from a public directory, there was no conflict of interest with subordinates or any research bias due to the position of power or any other power relationship. Because I presented myself as a student and not in my professional capacity as a financial director of a company, and because I am not a public figure I believe that participants felt comfortable. Because of my studies in management, both in my Business Master's degree as well as my Master's degree in Tax Law, and the studies done during this doctorate process I might have prejudged or inferred some answers or participants. To diminish this bias, I made the transcriptions and coded them through the software and my notes were based on the knowledge of BI and not on how each officer manages their companies.

Methodology

In this section, details about the methodology that was used to collect the data is be presented. Through in-depth interviews with semistructured questions, for which an open script was developed, information was obtained. These interviews raised questions on the topics and subtopics to be filled in accordance with the informational purposes of the research, for example awareness of BI concepts and solutions, as well as awareness on the importance of IT in their enterprises. Each interview was audio recorded after previous acknowledgement and authorization of the participant, and notes were taken

during the interview with their nonverbal communication, and clarifications made off the record, which were very helpful at the time transcribing the interview data.

Guion, Diehl, and McDonald (2011) recognized in-depth interviews as a tool that allows researchers to obtain rich background information, as well as seek understanding and interpretation of a certain phenomenon. To this end, meetings with the interviewer were held to gather information on the objectives of the research. Another view of the in-depth interview is given by Wertz et al. (2011) in which the authors established that "the in-depth interview is a limited form of talk" (p. 89), but the authors agreed that with a good interview and proper analysis the tool can be useful.

Participant Selection Logic

To obtain a possible list of CEOs to be interviewed, I accessed the public directory of the Chamber of Commerce and the Northeast chapter of the National Chamber of the Transformation Industry. According to the National Institute of Statistics and Information, in the region where the study is located there are 367 companies with an average of between 50 and 250 employees, being this the universe of companies to be contacted. This was done via an email explaining the research and asking if they were interested in a meeting to explain in person what the interview will be about and the expected results. The letter was sent through email, given that the directories had such information to achieve faster results. An email address will be given, as well as a mobile phone number, so the executives can get in contact and confirm a meeting.

As was recommended by Cibanal, Arce, and Carballal (2010), to establish a climate of empathy between the interviewer and the participants in carrying out

semistructured interviews, it is important to give a voice to our participants and to establish a climate of empathy and trust. This helps such that our officers were able to talk without feeling threatened or conditioned and making them see that the intention will be to understand them and never betray their confidence, allowing the persons to express themselves openly and without fear. The time and location of the interview were selected by the CEOs to have them feel more comfortable, and all of them were in a closed and private space.

In qualitative research, participants are selected for convenience according to their experience with the phenomenon of interest, contrary to the selection or random sample from a larger population, thus the use of a public directory with specific criteria. The data from selected participants are considered rich in detail and are often considered as dense or heavy descriptions. The number of interviews was nine as there were no definitive criteria as to the number of participants in a phenomenological study, and data saturation had occurred; for example, Patton (2002) determined "there are no rules for sample size in qualitative inquiry" (p. 242). Another factor for this sample size was the limited information of Mexican CEOs on BI systems, as noted in the last chapter, and in accordance with Englander's (2012) view of the importance of the participants' knowledge of the phenomenon more than the number of participants. There is an ongoing discussion as to the number of participants for a qualitative study; for example, Marshall, Cardon, Poddar, and Fontenot (2013) concluded after a thorough review of qualitative studies in information systems journals that the assignment of sample size is subject to

cultural factors, such as “journal of publication, number of authors and world region” (p. 21).

The number of participants was in line with Morse’s (1994) recommendation of at least six participants for phenomenological studies, as well as Creswell’s (1998), who recommended between five and 25. Also in support of this number is Gray’s (2014) case study in which only 10 women were studied regarding prostitution and crime. It is important to note that saturation was a factor in deciding that 9 were enough and no more participants were needed. Pietkiewics and Smith (2014) argued that the main concern in phenomenological research is the full appreciation of each participant, thus “samples in these studies are usually small, which enables a detailed and very time consuming case-by-case analysis” (p. 9).

Regarding the number of participants, according to Myers (2013) it is inappropriate to have a certain sample size. It is more important “that the people interviewed represent various voices” (p. 123). In addition, it is important to note that saturation was achieved once there was no new information or new insights being obtained from the participants; in other words, when the officers start repeating the same challenges and obstacles described in other interviews.

Saturation is understood when no new information is added as each new participant is interviewed; it was defined by Baker and Edwards (2014) as “when a researcher continues to sample relevant cases and no new theoretical insights are being gleaned from the data” (p. 18). This definition agrees with how Galvin (2014) defined it as “the point at which no new relevant information is forthcoming, even if more people

are interviewed" (p. 5). Seidman (2012) established that more than a specific number, it is important for researchers to have a clear understanding of the concept of saturation and sufficiency, but that it is more important to take note of the "practical exigencies of time, money, and other resources [that] also play a role, especially in doctoral research" (p. 58).

Data were collected from the sample until data saturation occurred. Qualitative research suffers from causal generalization (Masue, Swai, & Anasel, 2013); however, it assumes informants as subjects that reflect not only their individuality but also sociocultural constructs by which a group represents and gives meaning to the phenomena and things.

Instrumentation

In this section, the research instrument is described, as well as how the interviews were conducted and what the instrument included. Data were collected through a semistructured interview. The process of constructing such an interview was done through the review of other instruments developed in research addressing the use of computers and new technologies, as suggested by many authors including Lapeña (2012), Frels and Onwuegbuzie (2013), Calderón and Rodríguez (2012), Nelson, Onwuegbuzie, Wines, and Frels (2013), and Owen (2014)

The interview consisted of a presentation regarding the research and a thank you for participating in the research. It was then followed by an explanation that the interview was to be coded anonymously in order for them to feel free to express their ideas and their experiences regarding the lack of implementation of BI systems in their company. I

then explained to the participants that the interview was through a set of questions in which they can openly answer or skip as many as they choose to not answer.

The interview was programmed to last less than an hour; and if the participant agreed, was audio recorded with just an assignation of an identifier number so it could be reviewed later, but there would not be any list linking such numbers and the participant names. I then asked if there are any questions regarding the research or the methodology, and they were asked to, in their words, explain what has been told to the participant. If everything is clear, a consenting form was delivered for them to sign, and when they were ready the interview started. Such informed consent will be presented in Appendix A of this study.

These interview questions were aimed to obtain sufficient valid content derived from the theories described in Chapter 2 and the perception of the officers in their organizations. The questions in the interview were created toward answering each research question, in order to minimize any opinion or bias; these questions are detailed in a further section.

Pilot Study

As a way of doing a pilot study, the use of an expert experience regarding the interview was chosen. To obtain such expertise on these questions, Lopez (the name was changed to protect the identity) was contacted and asked if he could respond to such an interview. Lopez was a member of the member of the Center for Research and National Security (CISEN), the Mexican Federal Intelligence Agency, as well as serving as National Security counselor for President Calderon, the Mexican President from 2006 to

2012. Lopez was a former teacher of mine in a graduate class regarding BI and when approached at the beginning of this dissertation about helping the researcher he was very forward in his intentions of assisting the research. The results from this pilot study are presented in the next chapter.

Once all the interviews were done, each audio recording was transcribed, and the transcriptions were analyzed using the software Deedose. According to Woods (2010), the researcher makes the decision whether to use cross-case analysis or to analyze the data from each participant regarding each research question. In this dissertation the latter was selected.

Procedures for Recruitment, Participation, and Data Collection

As previously stated the officers were contacted via email, as their contact information was present in the public directory of the Chamber of Commerce and the Northeast chapter of the National Chamber of the Transformation Industry. From that directory, an email was used as an initial contact. In this email a brief explanation of the research was done, as well as provided my university's email and personal cell phone for them to contact me if they were interested in participating in an interview.

Once this initial contact was made, and there was an interest by the officers to participate in the research, there was a face-to-face interview scheduled according to the participants' agenda. I estimated that the interview would last approximately 1 hour. The interviews were audio recorded if authorized by the participant such that it can later be transcribed and analyzed. I personally made the transcripts of each interview. The audio recording and transcriptions were stored in a private corporate building safeguarded 24

hours by contracted security. It was made clear to all participants that they could exit the research at any point if they desire to do so, just by notifying me. Once data saturation was achieved, all participants were informed, via email, that their answers were being analyzed. They were contacted for confirmation of the results and finally, if they wished so, a copy of the final research was sent.

The interview questions were designed to connect with the research questions. As stated in earlier chapters the dissertation has two research questions, which were addressed during the interview. To identify which questions from the interview were related to each research question, they were coded as RQ1 for Research Question 1: What are the main reasons stated by CEOs as the cause for the lack of implementation of a business intelligence system in a small to mid-size companies located in Mexico? Also, RQ2 was used for the second research question: What are the challenges CEOs of small to mid-size companies in Mexico confront when trying to implement a new business intelligence system?

The following questions were the interview questions:

1. Would you say that your organization is in need of a system that coordinates all the different areas in the company? (RQ1) This question related to the general systems theory developed by Bertalanffy (1972) and the need for their organization for such a system.
2. Would you describe your organization as an entity that learns from its mistakes? (RQ1) This question, connected with organizational learning

described in the conceptual framework, is intended to see if officers perceive their organizations as smart or not.

3. Do you believe the main source of information from your company is data obtained from information systems or what your employees bring to the workplace? (RQ1) To confirm the idea that the main repository for knowledge lies within the personnel.
4. Do you believe that you as an officer of the company have enough abilities to make the best decisions or do you need technological tools to aid you? (RQ1) This question was aimed at understanding the application of the theory of administrative behavior postulated by Simon (1947) and described in Chapter 2.
5. How would you describe your knowledge of information technology, and its usefulness? (RQ1) Regarding the technology acceptance model developed by Davis (1989), it was important to understand how the officers perceive the usefulness of their current systems and the need for a new one.
6. What would you describe to be the number one challenge presented by you when establishing information technology solutions in your company? (RQ1) This question was created to identify the challenges that officers have faced in the past when implementing IT solutions.
7. Would you describe the information systems currently implemented in your company as tools that aid you in making better decisions or just record keepers? (RQ1) This question was concerned with the perception of the

officers of their companies as intelligent and it is directly related to the concept of BI (Shollo & Kautz, 2010).

8. When launching a new idea or a new concept inside your company, what is the biggest challenge presented to you? (RQ2) This question was intended to allow the officer to express the challenges presented to them, not only in BI systems, but in general, to then narrow it to BI.
9. If I were to tell you that there are systems currently on the market that would allow you and your company obtain more information and make better decisions, what would your first thought be? (RQ2) This question was guided in order for the officer to imagine a system in general, but then describe the first challenge that comes to mind in a BI implementation.
10. Would you like to add anything to the interview?

    At this point, the officer identified if the information given was enough or if there was anything else they believed was left out regarding the explained objective of the research and the interview.

Data Analysis Plan

To understand all the data obtained from the participants coding was used. Sets of predefined categories were defined, following the order the questions were asked in the interviews. The data were analyzed through the use of such major categories, as well as specific codes throughout the transcription and data analysis process that emerge during the analysis. The specific coding categories were discovered during the interview transcription. The specific coding categories were discovered when the first major

categories were analyzed through the software. It is necessary in any qualitative study to create a system of an underlying organization composed of global categories of the subject matter, which together with a specific qualitative analysis plan will guide the data classification.

Issues of Trustworthiness

Credibility

A methodological triangulation was used in order to confirm the patterns found in the interviews by sharing the results with the participants and confirming if they referred to what they were expressing, as well as comparing the data obtained from the different participants at different times (Carlson, 2010). Once the interviews were over, participants were contacted via email regarding their input.

Transferability

This research was conducted in a medium city of Mexico, but the results were heuristic, and they may contribute to further studies in other areas of the country. The questions can be replicated and analyzed similarly to confirm if these results are valid in other circumstances, the size of the company or region. Transferability is not probable with the small sample size presented, and since the sample was not randomly selected the possibilities of transferability are low. This is also strengthened given the fact that participants themselves chose to participate and were not randomly selected.

Dependability

In order to assure dependability, all notes and memos were kept safely in order to have an audit trail as suggested by Barusch, Gringeri, and George (2011). Also,

corroboration was made throughout the research to test if there were repeated patterns and if the research questions were adequately addressed.

Confirmability

Wester (2011) wrote that there are many factors that can affect confirmability, for example, the thoroughness of the researcher's field notes as well as the theoretical notes. The description of data collection procedures and analysis is also mentioned. To comply with these recommendations a reflexive journal was kept in which methodological decisions and their reasons were recorded, as well as logistics of the study, in order to foster reflexivity. Such journal will be kept in private storage for the following 5 years alongside other research material.

Ethical Procedures

Approval from the Institutional Review Board was obtained according to Walden University standard procedures. The approval number is 11-02-15-0059971. The interviews were made in Mexico with previous written consent from the participants. Such informed consent was made in Spanish, as it is the native language of the participants, and as it was required by the HHS. It contained the purpose of the study, information about the upcoming interview, the contact information of the researcher as well as the clause for them to exit the research at any time if they choose to do so.

The participants were informed that the data will be kept confidential at all times and stored securely in my private office. Because none of the participants were employees or had a direct relationship with me, there was no coercion or undue influence to participate in the research. All participants were informed about what the Institutional

Review Board consists of and how it works as it addresses ethical considerations. All information will be locked in encrypted files and securely stored for 5 years and then securely destroyed.

Summary

This study used a qualitative approach with participants in Mexico, through the use of semistructured interviews to answer an initial contact from the researcher to participate. The public directory of a Chamber of Commerce in Mexico and of the Northeast chapter of the National Chamber of the Transformation Industry was used to obtain a list of probable participants.

From each interview, sets of predefined categories were defined, following the order the questions were asked in the interviews. The data were analyzed through the use of such major categories, as well as specific codes throughout the transcription and data analysis process that emerge during the analysis. The specific coding categories were discovered during the interview transcription. The specific coding categories were discovered when the first major categories were analyzed through the software.

The data was transcribed and analyzed using the analytical software, using preexisting codes and codes generated by the researcher. Trustworthiness issues regarding credibility, transferability, dependability, and confirmability were addressed as required by the University and the Institutional Review Board. All data from this study will be kept in a private safe for 5 years, including the transcriptions, the research journal, and the coded data.

Also, issues regarding all required ethical considerations were addressed, and even though the participants were adults in nonthreatening situations and participated voluntarily in this study, the recommendations of the National Institute of Health were followed and a certificate from its Office of Extramural Research was obtained to perform the research.

Chapter 4: Results

The purpose of this qualitative phenomenological study was to explore and describe the lived experiences of CEOs in Mexico to obtain insight into the factors that have contributed to the challenges of implementing BI systems. The study involved collecting the information through a series of semistructured interviews of CEOs contacted through the public directory of Saltillo's Chamber of Commerce and the Northeast chapter of the National Chamber of the Transformation Industry. Through the information from the semistructured interviews, I sought to answer the two research questions: What are the main reasons stated by CEOs as the cause for the lack of implementation of a BI system in small- to mid-size companies located in Mexico? What are the challenges CEOs of small- to mid-size companies in Mexico confront when trying to implement a new BI system?

The chapter begins with a description of the pilot study and a discussion of how an expert in the field aided the researcher in the interview protocol, followed by a description of the research settings. I then detail the demographics of the participants, followed by an explanation of the data collection process, its analysis, and the evidence of trustworthiness. I conclude the chapter with the study results and a summary of the chapter.

Pilot Study

An expert in BI reviewed the original questionnaire for the semistructured interview. Lopez (a pseudonym to protect identity), was a member of the Center for Research and National Security (CISEN), the Mexican Federal Intelligence Agency. He

is now the president and founder of a BI consultant firm dedicated mainly to overview a Mexican company's main security and BI systems.

His responses confirmed that the interview questions were suitable for eliciting responses from the participants that address the research questions. It was important for me to engage in a conversation with the participants that allowed them to fully explain what the research was about and for the participants to give their experiences. Lopez suggested that in the course of the interviews the participants should express the reasons they themselves are not investing, if they are not, in BI systems, as well as their experiences regarding their fellow businesspersons. The revised interview was then sent to Lopez and after a review he commented that he thought it was an excellent tool to gather the information necessary to answer the research questions.

Research Setting

All of the participants of this study were interviewed in their private offices as requested by each officer in their emails. All interviews were conducted between November 17, 2015, and December 21, 2016. The participants were not influenced by any known personal conditions, such as financial difficulties, emotional stress, or any other condition as expressed by themselves in the course of the interview.

The city in which the interviews were conducted is in the northern region of Mexico, and it is heavily influenced by the industries established there. Many international factories operate in the region, including car assembly plants from the United States, Korea, and Japan, as well as many satellite industries serving these companies. The participants possessed some knowledge regarding BI and their systems.

None of the participants declared that they were having trouble at the time of the study; all of the CEOs stated that their companies were performing sufficiently and that business was as usual. Some of them even stated that their companies were experiencing rapid growth, due to the recent investment announcements by foreign companies in the region.

Demographics

The specific agencies, locations, names of participants, or any other specific demographical data will not be detailed in order to maintain confidentiality. The participants of this study were all CEOs of companies in the northern part of Mexico. All participants finished college with different majors, and some of them were post-graduate. Table 4 contains the participants' characteristics.

Table 4

Participant Characteristics

Age	Gender	College major	Years as CEO
46	Male	Business management	15
44	Male	Master's, Business Administration	17
40	Male	Business management	16
37	Male	Law	7
48	Male	Civil engineer	17
39	Male	Master's, Business Administration	11
67	Male	Architect	27
46	Male	Commerce	7
39	Female	Finance	12

As seen in Table 4, there was only one woman, which is important because according to Zabludovsky (2015), only 3.7% of women in Mexico have a position of

president or CEO in Mexican companies. The average age of the officers was 45 years and the average duration as CEO was 14 years.

Data Collection

This study included nine CEOs in charge of small to medium companies in Northern Mexico. The original idea for the study was that eight participants were to be interviewed, but there were nine initial respondents. After each interview data analysis was done to verify in what ways the theory-based and emerging categories had reached saturation. After the seventh interview saturation was reached, as no new categories emerged, and all of the comments in the interviews reaffirmed the tendencies; nevertheless, all nine interviews were analyzed. Interviews commenced after receiving IRB permission on November 2, 2015, with approval number 11-02-15-0059971. Data were collected using semistructured interviews. Interview durations ranged from 45 to 70 minutes and took place at a location of each participant's preference. All the interviews were recorded using a digital recorder and later transcribed.

For privacy reasons names of the participants were not included in the recordings. Each participant received a code prior to the interview, and the code was used on the recording. For this study, the code was Participant followed by a number. The codes for the study ranged from Participant 101 to Participant 109.

Prior to each interview, each participant received an email with a formal invitation to the study, as well as an attached consent form. Participants reviewed both documents before the interview. Once a meeting was established, the participants reviewed the consent form face-to-face to allow for any questions and to sign the consent

form. Participants were asked if they wanted to see a brief presentation regarding BI and its usefulness. Only a couple of participants stated they wanted to see it. The rest explained that they had experience with such systems, via education or their professional background. All the interviews were kept digitally in the recorder and the transcriptions under safe conditions, as approved by the IRB. No unusual events occurred during the data collection stage. All of the participants signed and consented to the interview.

Data Analysis

For the analysis of the information the Dedoose software was used. This software allows a researcher to upload documents, pictures, and/or audio. All transcripts of the interviews were uploaded and as data was encoded, a list of pre-defined categories was established in order to start coding each interview and look for data saturation. Dedoose software allows the researcher to code words, sentences or entire paragraphs with the purpose of finding patterns and repetition, including the creation of a code cloud (see Figure 1).

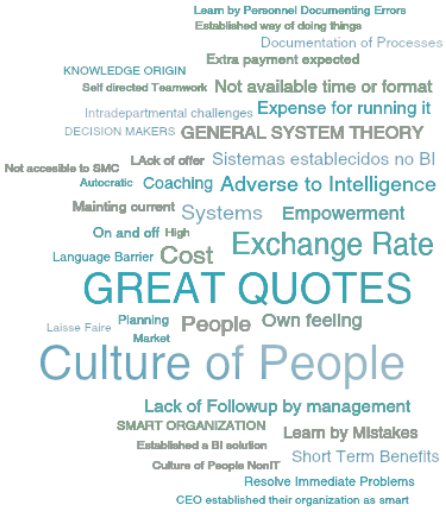

Figure 1. Code cloud. Retrieved from Deedoose Software.

As interviews were transcribed and uploaded, each one was analyzed and if the answers from the participants matched these preexisting categories, then those words were encoded into them. When an answer from a participant did not match any pre-defined category, an emerging theme was created, and when no more emerging themes were necessary, at participants eight and nine, data saturation was completed. The software also allows the researcher to include an answer in one or more categories, something that became common after the fourth analysis. This feature allows the researcher to see an answer from different perspectives and analyze patterns to see the repetition amongst the participants transversally.

Appendix C contains the preexisting coding categories and the rationale for their selection. Open coding was used at first when tentative labels appeared as the data was analyzed, then by identifying relationships between these codes axial coding allowed the

rest of the categories to emerge. These emerged from the research questions and the objective of each of the questions from the interview and included knowledge origin, general systems theory, great quotes, knowledge in IT, decision makers, leadership style, main challenges IT, non-IT challenges, smart organization. After all data was analyzed some of these categories remained valid and were used constantly. Some, however, were only mentioned a few times during the interviews. Before data collection I used *epoche*, by describing my own experiences with BI systems in my reflexive journal. This allowed me to purify my experiences of the assumptions inherent in them (Overgaard, 2015).

During the analysis of the data throughout the nine interviews, more themes emerged that were part of the original ones. As mentioned earlier, by the seventh interview the great majority of the emerging themes were filled. The last two interviews were just a repetition of those themes, and including more interviews would have only added redundancy to the data. The emerging themes are shown and explained in Table 5.

Table 5

Emerging Themes

Parent Code	Emerging Themes
Knowledge origin	People
	Systems
General system theory	Documentation of processes
	Intradepartmental challenges
	On and off
Great quotes	
Knowledge in IT	High
	Medium
	Low

(*table continues*)

Parent Code	Emerging Themes
Decision Makers	Own feeling
	Market
	A non-BI solution, but IT based.
Leadership style	Empowerment
	Coaching
	Autocratic
	Laissez-faire
Main reasons not to invest in IT	Language barrier
	Exchange rate
	Expense for running it
	Lack of offer
	Cost
	Not available in time or format to be useful
	Resolve immediate problems
	Short term benefits
Main IT Challenges	Extra payment expected
	Culture of the people
	Averse to intelligence
	Lack of follow-up by management
	Keeping the system current
	Planning
Smart organization	CEO established their organization as smart
	Learn by mistakes
	Learn by personnel documenting errors.

Emerging themes are now explained. Direct quotes are used to exemplify some of them. It is important to note that these interviews were conducted in Spanish, so language structure may differ from that of the natural English speaker in order to remain as loyal as possible to the original idea expressed by the participant.

Knowledge origin—People involved grouping all the expressions in which the CEO stated that it is the people and not the systems that form the origin of the information that the company uses day to day. For example Participant 107 stated, “It is

only the people inside the companies that can have knowledge. The computers can keep information, but knowledge is only available to the people."

Knowledge origin—Systems involved the expressions of officers that established their main source of information in the company as the systems they had implemented. For example Participant 105 declared, "The information that we use on a daily basis emerges from our systems, although they are quite rudimentary. We still use spreadsheets for our inventories; they still give us the needed information."

General systems theory—Documentation of processes relates to how officers apply the general systems theory in a way that their organizations work by documenting processes from different areas and making them work together. Participant 109 professed, "We have the whole process documented; each area knows exactly how to talk to any other area, and if there is a mistake we can see where exactly the miscommunication happened."

General systems theory—Intradepartmental challenges occurred when the officers perceived their company as being just a set of different departments and they also were in a constant battle with each other. Participant 101 declared, "Each department has its own objectives, and unfortunately sometimes these objectives benefit the department as a unit but not the company as a whole, and that is where I come in."

General systems theory—On and off refers to those officers who believe their organization sometimes acts as a system and sometimes as merely a set of units. Participant 106 acknowledged, "Even though I wish I could tell you that my company

works hand-in-hand in all of the departments-- and sometimes they do and it is beautiful--sometimes each department fights for its own benefit."

Knowledge in IT—High, Medium, Low refers to the level each officer answered as to their own perception of their level of knowledge in information technology or systems.

Decision makers—Own feeling is when an officer established that all or most of the decisions they made during the course of the day were by their own feeling and not sustained by any external means of information. Participant 107 declared, "Most of the decisions we made are based on what our own executives feel and some on my own feelings."

Decision makers—Market refers to when an officer established that the decisions he or she made were purely based on what the market dictated. For example Participant 109 offered this information when asked about the process when a major decision in the company was made.

Decision makers—A non-BI solution, but IT based refers to some companies that had some sort of solution implemented but they were merely a spreadsheet that archived information and not a system that really helped in making a decision. Participant 109 declared:

> We use a bunch of information stored in different spreadsheets, but it is difficult to have them printed out, because I am not an expert on computers, so when they are in printed form in front of me, I can then use this information to help me make a decision.

Leadership style—Empowerment: Many officers declared that they allowed their employees to make the decisions and only measured results. Participant 104 declared, "I am of the idea that when a department is working and giving results, the only thing the department head needs is some kind of encouragement, or empowerment, and let them work on their own."

Leadership style—Coaching: Some officers, on the other hand, had the idea that their employees only needed some kind of coaching and guidance. Participant 103, as well as Participants 101, 105 and 106, all openly declared that their leadership style was coaching.

Leadership style—Autocratic was defined when officers declared that all of their employees did exactly as they were told and no one had an opinion. Participant 109 declared:

> I believe my leadership style is autocratic. That is the way my father taught me, to give orders to my employees and not let them have an opinion. I am the most important person in the company, thus I should be the one making all the decisions.

Leadership style—Laissez-faire, according to Johnson and Hackman (2003), is a leadership style that allows employees to have complete control of their decisions. Participant 104 stated:

> I let the employees do what they believe is best for the company. I've made investments in the past in training them and I am fully confident that they are

> capable of making the best decisions, only once in a while I talk to them and see if they are doing the correct thing.

Main reasons not to invest in IT—Language barrier encompassed all affirmations by officers that they couldn't implement an IT solution given that they themselves or their employees couldn't understand the language the solution was offered in, mainly English. Participant 101 commented, "The problem is the language. Even though I may understand English very well, my employees have to operate machinery or commands in the computer designed and written in a language that they have only a basic knowledge of."

Main reasons not to invest in IT—Exchange rate refers to when an officer not only blamed cost as a challenge but also correlated it directly with the exchange rate between the Mexican peso and the U.S. dollar. Participant 101 declared:

> When I quote a system or any equipment I know the exact amount of U.S. dollars I need to spend, but unfortunately I have no idea the Mexican pesos amount. This year alone, there has been a 30% devaluation. This makes it almost impossible to think of investing anything that is quoted in dollars.

Main reasons not to invest in IT—Expense for running it indicated that the challenge for an implementation was a high cost perceived by the officers to run a system, some of the officers believed the cost would be high and never implemented a system, while others had some sort of implementation of an IT solution but due to the fact that people wanted some sort of economic incentive to use it, they dropped it. Participant 107 also stated:

> A lot of the times if the employee does not have an economic incentive to use a new tool they simply do not care. They believe that using a new system is an extra part of their job and thus expect an extra payment, elevating the total cost of an IT project.

Main reasons not to invest in IT—Lack of offer included all affirmations from who stated they didn't have knowledge of any system for their small companies, that they imagined the system developers would only work with large international companies. For example Participant 106 noted, "There is a clear lack of offers for smaller companies. I once looked into SAP, but the cost was prohibitive, and I could not find any smaller solution for my company."

Main reasons not to invest in IT—Cost refers to when an officer complained that the cost was too high for them to implement, but they did not mention anything about the exchange rate. Participant 103 declared, "The cost is too high for a company, from investing in computers, training, and then software licenses. I've looked into it a couple of times, but the cost is prohibitive."

Main reasons not to invest in IT—Not available in time or format to be useful: As with the previous theme, there were some officers who started implementing some sort of IT solution, but they found that the information that the systems provided was not useful in the time or the form they needed it to make a decision. Participant 108 answered, "The problem with the systems we've tried in the past is that the reports they gave was garbage information; I mean information that is no longer any good because it has become obsolete."

Main reasons not to invest in IT—Resolve immediate problems: Some officers believed that they weren't able to implement an IT solution because they were focused on resolving immediate problems within the company and not thinking of a broader strategy. Participant 109 gave a clear example:

> I wrongly have to deal with day–to-day activities and problems. I do not give enough time to overview the company's strategy. In a phrase, the urgent takes the place of the important; such as an implementation of a system that may or may not help me in the future [that] I need to resolve for today.

Main reasons not to invest in IT—Short-term benefits referred to the lack of vision by officers for the system implementation. Some officers thought that the systems might offer a solution for them in the medium or long term, but that these times were too long to justify an implementation. For example Participant 106 stated:

> I have been offered various systems to implement in my company. I cannot tell you if they were a BI system or an IT solution that might just help me control my company, but when I asked the consultants for the time frame for any benefit, they told me it would take months before I see any benefit. It was too long for me.

Main IT challenges—Extra payment expected refers to the attitude of employees expressed by officers of personnel, requiring an extra payment to work on the new project or idea. Participant 107 declared:

> I believe the culture of payment for extra work is very deep rooted in the minds of my employees and it complicates the implementation of any idea, not to mention putting them to capture something in a computer besides their usual job.

Main IT challenges—Culture of the people referred to the opinion of officers that the challenge for them when implementing a system was the fact that the people didn't have the attitude or knowledge to use a system. It also refers to when officers declared that the people just weren't ready to use a system, that they were accustomed to one way of working. Participant 107 stated:

> I believe that in Mexico there is a culture of aversion to change. They learn to do things in school one way and it is very difficult to have them change. I cannot blame a person for not doing something or not being able to do something that they do not have the basic knowledge to do because of the low level of education in this country.

Main IT challenges—Averse to intelligence: According to Holzmann (2005), Navarro (2010), Nilson, and Gustafsson (2012), and Lopez de la Torre (2013), in Latin American countries there is a clear aversion to the use of the word intelligence, both in private companies and in national governments. When officers stated that their employees had disgust for the word intelligence this emerging theme was used. Participant 103 gave a clear example of this by declaring:

> It has been a very difficult process for me to have people being able to trust their coworkers with the information they gather and use. They believe information is power and are very cautious about sharing it. I guess it has to do with the era we grew up in, and how our governments used the intelligence for their dirty war.

Main IT challenges—Lack of follow-up by management refers to when an officer stated that the main challenge they confronted when implementing an IT solution was

that the middle management did not do any follow-up. For example Participant 105 detailed:

> After I started implementing only an inventory solution, a couple of weeks passed before my managers told me that the employees were not filling the system and that they were too busy with other assignments to make them comply.

Main IT challenges—Keeping the system current: When an officer had implemented some sort of low level solution, like a spreadsheet, some of them affirmed that they started with an excellent will to run the system but that their employees could not keep the system full of relevant and current data, thus making it unusable. Participant 101 asserted:

> I have tried to implement many solutions in the company. Some of them have worked and some of them have miserably failed. One of the challenges I confront when implementing a new system is making the employees fill the forms and keeping it current. For the first months, the system is very good. People get excited about it and use it, but as months go by people start forgetting to use it and the information becomes obsolete. Once we try to fill in missing information, the task is enormous and we finally let it die.

Main IT challenges—Planning is when an officer referred to having to plan and executing every detail of an implementation, because their employees weren't able to do so, or they have no clear understanding of the project. For example Participant 103 declared, "It is very difficult in the planning stage to have all of the employees

understand the basic concept of the idea and to have them be a part of the planning phase."

Smart organization—CEO established their organization as smart: In order to understand if the officers understood their companies as a smart organization a question was designed to acquire this information. When a CEO established directly that their organization was indeed smart, this emerging theme was used. Participant 106 affirmed, "I can certainly assure you that my company is a smart organization. The employees in this company not only work together, but they also learn day to day with new things and ideas which are applied."

Smart organization—Learn by mistakes referred to affirmations made by officers that their organization had an established system of documenting failures in their operation and their corrections. Participant 104 answered:

> My company has been evolving since I first started it. Nowadays when an employee or a department makes a mistake it is documented, as well as what was done to resolve this, and we keep a file that any employee can read and learn from.

The system used for coding was Van Kaam, as explained in Chapter 3, using in Vivo coding (Saldaña, 2013). Following the codification of all interviews, and when no new emergent categories arose, all the coded expressions were put to the test as described by Moustakas (1994): The expressions were tested to answer if each one of them contained a moment of experience that could eventually be a necessary and sufficient constituent of the experience and if so is it possible to abstract this time and label it,

without violating the formulation presented by the participant? On the other hand the expressions that did not meet these two requirements were eliminated. After the aforementioned expressions were eliminated, the remaining expressions were again categorized into the emerging themes and analyzed for patterns.

Evidence of Trustworthiness

Credibility

As stated in Chapter 3, once the data was analyzed and the emerging themes arose, the information was analyzed, and a code application table emerged. Member checking, or respondent validation (Merriam & Tisdell, 2015), was done. First this code application table was emailed to the participants to see if they thought that the code application numbers reflected what they thought were the most important reasons for a lack of implementation, as well as the main challenge when implementing an IT project. All of the participants responded that they agreed with such application and that it represented the ideas they wanted to transmit. Also to enhance credibility after the participants agreed to the code application table, I contacted three participants and presented a preliminary analysis of the results and all of them established that my conclusions presented agreed with their perceptions.

Transferability

Because the questions in the interview offered a real insight into the research questions, and because of thorough documentation of the data collection and analysis processes, I expect this study can be replicated and analyzed similarly to confirm that the

presented results are valid in other circumstances, such as the size of the companies studied, or in any other region of Mexico.

Dependability

As stated in the previous chapter, the in-depth notes taken during the interview as well as the transcripts from the interviews were safely kept, as suggested by Janesick (2004). Corroboration was made during the research to test the repeated emerging themes and to ensure that the research questions were adequately addressed.

Confirmability

Following Materud (2001), a reflexive journal with the methodological decisions and their reasoning was recorded and safely kept to obtain confirmability and foster reflexivity. I was prepared to do member checking, or respondent validation (Merriam & Tisdell, 2015). The reflexive journal will be stored inside a safe. This journal will also be destroyed after 5 years.

Study Results

This section is organized by research questions and emerging themes. It explores each question and presents data to support each finding. As expected based on the bibliography research, none of the participants had a BI solution implemented. In fact just one of the participants established that the company had invested in a system to control expenses, but that nowadays the system was obsolete. Although most of the participants were aware of the benefits of using a system in their organization, there were many reasons why none of them used any.

Research Question 1

The first research question was: What are the main reasons stated by CEOs as the cause for the lack of implementation of a BI system in small to mid-size companies located in Mexico? In the following paragraphs each and every one of the emerging themes that can be observed in Figure 2 will be discussed.

Media \ Codes	MAIN REASONS NOT TO INVEST	Cost	Exchange Rate	Expense for running it	Lack of offer	Language Barrier	Not available time or format	Resolve Immediate	Short Term Benefits
109.docx		1			2			2	
108.docx		1			1		1		1
107.docx		2	4	5		1	1		
106.docx		3	2	1	3				2
105.docx		2	1				1		1
104.docx		1	1		3				
103.docx		1	2	1	1				
102.docx		2			3	1	1	1	1
101.docx		2	3		2	1	2		
Totals		15	13	7	15	3	6	3	5

Figure 2. Code application, main reasons not to invest in IT.

Cost. We can see in Figure 2 that all of the participants mentioned cost as a factor for not implementing a BI solution. In fact Participant 107 declared:

> I've tried to invest in information technology solutions for my company, but the costs are prohibitive. One time I even had consultants in my office telling me all the benefits of their system and we even sampled it for a few months, but then by the time we decided to invest we realized that the cost of implementing was not only the initial purchase cost, but an annual maintenance fee almost the double as the initial fee, and that is when I decided it was too expensive to invest.

Businesses in emerging economies like Mexico are very sensitive to cost. The major economic crisis experienced in Mexico over the past four decades has left businessmen very cautious about their investments. Participant 105 declared:

> I was once a very aggressive businessman. I had no fear in investing all my profits and expecting a return in a medium term--I mean three to five years--but in the eighties there was this big recession and I almost lost it all. That is when I decided I must be much more conservative about new investments.

Exchange Rate. As mentioned before, this is closely related to cost; in Mexico there is a considerable amount of goods that are imported from foreign countries, mainly the United States (INEGI, 2015), thus they are dependent on the exchange rate between the Mexican Peso and the U.S. dollar. Not all participants mentioned this as a factor; Participants 102, 108 and 109 only mentioned cost but not the exchange rate, but there were participants that mentioned them several times in their interviews. Participant 107 mentioned four times that the exchange rate was a factor; he declared, "In the last months there has been an important increase in the exchange rate, and I can no longer anticipate how next year will be for my purchases from the U.S."

Participant 101 also mentioned exchange rate several times at the interview: “The company uses very highly specialized equipment that is sold only in the United States, and a budget is done, but it was in dollars, thus the exact investment amount was uncertain.”

Expense for running it. Only three participants mentioned that a factor for not investing in BI solutions was that there was an additional cost for running it. Participant 107 mentioned that this cost was related to the employees’ expectation for extra payment to use the system. During the interview the participant gave affirmations such as “no one wants to take responsibilities if there isn’t an extra payment” or “besides the cost of implementing a system one must consider the economic incentives that have to be given to the employees.”

Participant 103 also mentioned that the employees were expecting some sort of economic incentive to utilize their system, and that in fact “one [time] I tried to establish an automated inventory system, but people expected to have an extra payment in order to fill out the system; otherwise they said that it was already done.”

Lack of offer. Lack of offer of solutions for companies in Mexico was another theme most mentioned as reasons for the lack of investments. Given that the economy in Mexico is an emerging one, there is a very small market for innovative solutions. Participant 103 stated, “The availability of systems I’ve looked into are for larger companies. For us small companies the only solution we can have access to is basic spreadsheets like Google docs, that we can easily use over the Internet.”

Participant 106 confirmed that he once looked into SAP but was discouraged:

> I started looking for a solution for my company. It has been growing a lot, and I wanted some sort of information technology tool that allowed me to glance at information for the company while on the road. The only offers I got were from big companies such as SAP, and it was too much.

Language barrier. Only three participants mentioned the language barrier as a reason. As can be observed in Figure 2, Participants 101 and 102 both declared the language barrier a factor, but they also declared that the lack of offer was one. There is a direct relation between these two emerging themes, because the only offers of BI solutions are made in English. There is at first no desire to look into them and thus adopt them, so there is a language barrier for their use. As stated by participant 101:

> Sometimes I teach my employees how to use the computer system established, but even if I understand English perfectly, the language in which the system was designed, my employees do not. They didn't learn English at school and their knowledge is pretty basic, so once a system error appears that they have not dealt with, it all collapses and I have to come down and read it and help resolve it. I couldn't imagine having the whole company English language software.

Not available in time or format. The fact that the participants wouldn't think that the BI system would bring them information in the time or format they needed was also a factor mentioned by participants in the study. For example Participant 101 declared:

> I once installed a system that would supposedly help me get the information to run my business. We used it for a couple of months, but it took me longer to

interpret the data it was giving me than go look at the printed data in the manual reports. I confronted the consultant on this and they told me that it would take some time to get accustomed to the new formats. Unfortunately, time was one of the things I didn't have.

Participant 106, on the other hand, stated, "The information we already have via our rudimentary Excel systems is more than enough. I don't think a system could give me anything I do not currently see." When I talked to this participant about the advantages of data mining and smart organizations, as seen in Chapter 2, the participant replied that those things were for big companies to take advantage of.

Resolve immediate problems. Only two participants talked about how the urgency of their daily company lives led them to take out the time to think of a strategy that will include the implementation of new systems, as described earlier. Participant 102 affirmed, "Sometimes I see myself as a fireman who is constantly putting out fires in the company, and at the end of the day I am too tired to think of new systems or ideas."

Short term benefits. Four participants stated that one of the main reasons they do not invest in a BI system is because they do not believe there is a short-term benefit from doing so. Participant 102 admitted, "The time it takes for a system to start giving me information that will help me exceeds the time I have to run the business. It may be worth it in the long term, but I have to think of tomorrow, and not the day after tomorrow." Another declaration, this time by Participant 108, coincides with the idea: "I am really convinced that a BI system will bring many benefits to the company; the question is

when. With the market fluctuations, I cannot plan ahead farther than one year, and systems are not that immediate."

Research Question 2

The second research question was: What are the challenges CEOs of small to mid-size companies in Mexico confront when trying to implement a new business intelligence system? Figure 3 represents the code application of the emerging themes for this question.

Media \ Codes	MAIN IT CHALLENGES	Adverse to Intelligence	Culture of People	Extra payment expected	Lack of Followup by	Mainting current	Planning
109.docx		1	4				
108.docx			3				
107.docx		1	6	1	2	1	1
106.docx		1	2	1	1		
105.docx			3		2	1	
104.docx			2	1			
103.docx		2	1				1
102.docx		1	3	2			
101.docx		1	1			1	
Totals		7	25	5	5	3	2

Figure 3. Code application, main challenges in IT implementation.

Averse to intelligence. Six participants stated that indeed their employees had an adverse reaction to the word intelligence; all of these participants believed that this aversion came from how the government used the intelligence agencies in past decades to pursue political enemies. Participant 109 openly declared,

> As soon as I use the word intelligence in my company people stare, thinking it is some scheme to take advantage of them, to obtain any knowledge they might have on the system and fire them. I believe it has something to do with what happened in the past with the government.

Culture of the people. Clearly the main challenge in an information technology system implementation was the culture of the people. All of the participants cited this challenge; some of them stated that it was due to the education the people received in the past, while others stated that it had to do with the way business is done in Mexico. For example Participant 109 affirmed:

> I have tried so many times to teach my employees to think for themselves, to bring new ideas to the company, and to utilize the systems we have in place, but they are really very hard-wired into doing something one way and I cannot make them to think differently. It is definitively the culture of the people one of the challenges I face with a systems implementation.

Following this same idea, Participant 101 answered, “I have training courses for my employees, but the educational level in Mexico is a challenge. I cannot make an employee learn something that he does not have the basis for that was supposed to be taught in school.” When asked about what types of things an employee could not learn,

the answer was that they do know how to use computers, aside from the basic browsing and productivity suites. Anything more complicated than that and they were stuck, and training them with any advanced system could take months.

Extra payment expected. As seen in Figure 3 only four participants mentioned that employees expected an economic incentive or extra payment to use a system. Participant 106 clarified:

> My workers are very cautious about their duties and what they are paid for. One can tell them to do something extra once in a while, but once a system has been implemented, people expect an economic incentive to use it. When I tell them it is their obligation, they always answer with the same phrase, that it is not established in their contract or duties to use a system. I once tried to change the contract to include such terms, but they immediately wanted an additional raise in the salary due to this change, so we decided to keep using our old systems instead.

Lack of follow-up by management. Three participants mentioned that management was partly at fault for the lack of implementation of systems, even though the officers ordered management to oversee the implementation and use of new systems. Sometimes they didn't follow up and the system ended up obsolete. Participant 107 explained:

> We have tried several times to implement not an information system like you mention as a business intelligence one, but simple inventory tracking systems, and we do the training, and we incentivize the employees, but after a couple of months, I realized that middle management wasn't using the system to track the

> inventory. They were still doing it by hand with the employees, and when asked the reason, they told us that they simply didn't like it and that even though employees filled it up, they preferred to manually check all inventories, and some of them even told me that they have instructed floor employees to concentrate on their reports, rather than filling out the systems.

Maintaining current. Similar to the last theme, the fact that employees or middle management wouldn't fill out the systems, thus making their reports unreliable, was a theme that three participants mentioned in the interviews. Participant 105 elucidated this idea by stating:

> It has been a continuous effort from me and my high level officials to oblige the workers to use the systems. I have logged on more than once to find out that the information is a week old. Why would I need a week old inventory of my basic products? I need to refill purchase orders with current numbers, so I end up counting each of the items I need and making purchase orders. There have been many ideas implemented to have my workers fill the system, but without them convinced to do it, it is impossible.

Planning. Finally, only two participants stated that one of the challenges to implement a BI system was that it would be their effort to plan and execute the plan completely. Those two participants agreed that it was only through their vision that the system would be implemented in a way that would correctly serve them. Participant 107 offered the following insight:

> It is only when I personally do the planning and implementation, when something goes how it is supposed to go, that the rest of the people put their input into the implementations, and I end up working with some sort of monster.

Summary

The purpose of this phenomenological study was to examine, through interviews, the perception of some CEOs regarding the challenges and implications of the implementation of a BI a system in their organizations. The study involved collecting the information through a series of semistructured interviews of CEOs. Through the information from the semistructured interviews, the researcher aimed at answering the two research questions: What are the main reasons stated by CEOs as the cause for the lack of implementation of a business intelligence system in small to mid-size companies located in Mexico, and what are the challenges CEOs of small to mid-size companies in Mexico confront when trying to implement a new business intelligence system?

An expert in BI reviewed the original questionnaire for the semi-structured interview and confirmed that interview questions were suitable for extracting responses from the participants that addressed the research questions. The expert suggested that during the course of the interviews the participants should express the reasons they themselves are not investing, if they are not, in BI systems, but also what their experiences are regarding their fellow businessmen.

All of the participants of this study were interviewed in their private offices, as requested by each officer in their email. The city in which the interviews were conducted is in the northern region of Mexico, and it is heavily influenced by the industries there.

None of the participants declared that they were experiencing any difficulty at the time of the study; all of the CEOs stated that their companies were in good shape and that business was as usual.

This study included nine CEOs in charge of small to medium companies in Northern Mexico. The original idea for the study was that eight participants were to be interviewed, but there were nine initial respondents. After each interview data analysis was done to verify in what ways the theory-based and emerging categories had reached saturation. After the seventh interview saturation was reached, as no new categories emerged, and all of the comments on the interviews reaffirmed the tendencies; nevertheless, all nine interviews were analyzed.

For the analysis of the information the Dedoose software was used. This software allows the researcher to upload documents, pictures, and/or audio. All transcripts of the interviews were uploaded, and as data was encoded, a list of pre-defined categories was established in order to start coding each interview and look for data saturation. As interviews were transcribed and uploaded, each one was analyzed and if the answers from the participants matched these preexisting categories, then those words were encoded into them. When an answer from a participant did not match any pre-defined category, an emerging theme was created, and when no more emerging themes were necessary, at participants eight and nine, data saturation was completed.

During the analysis of the data throughout the nine interviews, more themes emerged that were part of the original ones. As mentioned earlier, by the seventh interview the great majority of the emerging themes were filled; the last two interviews

were just a repetition of those themes, and including more interviews would have only added redundancy to the data. The emerging themes were shown in Table 5 and explained throughout the chapter.

As expected based on the bibliography research, none of the participants had a BI solution implemented. In fact just one of the participants established that the company had invested in a system to control expenses, but that nowadays the system was obsolete. Although most of the participants were aware of the benefits of using a system in their organizations, there were many reasons why none of them used any. Chapter 5 includes an interpretation of the findings as well as the limitations for the study, recommendations and implications.

Chapter 5: Discussion, Conclusions, and Recommendations

Using and implementing IT systems in Mexico are scarce. There is a paucity of information on successfully implementing a BI system in a Mexican company. Through a phenomenological qualitative study, I explored the perceptions of CEOs on the challenges and implications of implementing such a system in their organizations. By examining the thoughts of these CEOs, I revealed their lack of interest in BI systems and the reasons for such lack of interest, as well as their thoughts and perceptions regarding the mentioned IT tool. The results of this study can be used to enhance current IT implementations in Mexican companies.

Understanding these factors provides a foundation for future studies in Mexico and countries in Latin America. It also delivers strategic information to executive officers that they can apply to their enterprises to attain a successful BI implementation. With the understanding of how current CEOs think of IT implementations, current students have access to current managing techniques of Mexican CEOs.

The main reason stated by these officers for the lack of investment in BI systems clearly was the cost and the relationship with the exchange rate. Because Mexico is a country with close commercial relationships with the United States, this was to be expected. The main challenge, once an implementation started, was trying to convince people to use it. The culture of the people is not conducive to understanding how a new system might be of aid to them. According to Cimoli (2000), in Mexico it is not only necessary to adapt the internal organizational culture of a company for a new implementation of a BI system designed for a highly functional working environment,

but it is also required for employees to understand a complete new way of working and interacting with their coworkers. In this chapter, I include the interpretation of the findings, the limitations of the study, recommendations, implications, the significance of the study, and the conclusion.

Interpretation of Findings

The major reason for the lack of investment coincides with the conclusions of Linares (2012); Aguilera-Enríquez, González-Adame, and Rodríguez-Camacho (2011); Fernández (2013); and Luftman and Zadeh (2011), who stated that there was a clear gap in investment in third world countries due to the differences in cost and the effect of economic crisis on IT investment in emerging countries.

The participants all expressed their concern for the economic factor when making a big investment, especially one in IT systems, and most of them conveyed a clear preoccupation with the instability in exchange rate, in accordance with Luftman and Zadeh (2011), who established that the volatility of economies in Latin America and Southeast Asia makes it very difficult to create a reliable forecast for companies there. One participant in this case, Participant 103, said, “I am ready with a budget established in U.S. dollars, but I have no idea how many pesos that will be when I need to purchase everything.” It is clear that the economic factor, that is, the initial cost or its relationship with the exchange rate, marked a clear difference in an investment decision. Even though there were differences between the ages of the participants, all of them expressed this concern; It was to be expected that only those participants who lived through the big Mexican recession of the eighties would be affected, but the last year marked an

important devaluation for the Mexican peso, thus impacting the decisions of each of the officers involved in the study.

The second major issue in the lack of investments was the lack of offers. In the literature review, there was only one mention of the lack of system availability in non-developed countries. Calderón and Rodríguez (2012) made a study in Venezuela and found that there were minimal local system offerings. Most of the participants stated that the only BI solutions they reviewed were from U.S. or European companies, and that not a single company in Mexico offered such a system. There are some companies in Mexico that offer such systems, but the lack of publicity on specialized Mexican media makes them invisible to the officers involved in the study.

Orantes (2011) established that in Mexico information systems theories are little known to managers who do not work at international companies. This was also confirmed by this study, as only a few of the participants had a solid idea of what a BI solution was and how it might benefit them. As a result of a presentation provided by the researcher, some of the officers stated that they were now interested in such a solution, and that they would be very inclined to evaluate a proposition if cost was not an issue and if the systems were localized to their way of doing business.

Although most of them used a basic computer productivity suite, none of them really had a BI solution implemented. Goodwin (2011) stated that because of the popularity of spreadsheet software, many companies rely on them to archive and analyze their data, and this makes a barrier for new systems to be implemented. This was also confirmed by this study; participants said that they already had the information from their

systems that they needed and that entering information on a new system, and learning how the results are displayed, would be much more complicated than continuing to use their regular ones.

Siffat et al. (2011) established that one of the most critical factors for a new IT system implementation was the language barrier. This was not confirmed by this study; in fact, only three of the participants mentioned that the language was an obstacle in new IT investments. When asked if it was a barrier, they said that the productivity suites they used were in Spanish, and that every day new software offerings in their language were common.

Regarding the challenges for an IT implementation, the main challenge observed by the participants was the culture of the people. This is in complete accordance with the literature review in Chapter 2. Montenegro (2013); Cataldo et al. (2011); and Siffat et al. (2011) theorized that cultural barriers were a definite factor when companies invested in BI solutions. The participants all agreed that their employees had a clear resistance to change, as confirmed by Simeon (2002), who affirmed that there were cultural deficiencies in emerging economies, such as a resistance to change and a scarce innovative culture.

Adversity to intelligence, the second most important challenge presented to officers in this study, was also confirmed by authors such as Holzmann (2005), Navarro (2010), Nilson and Gustafsson (2012), and Lopez de la Torre (2013), all of whom established that governments in Latin America in the past have used their intelligence agencies to pursue political enemies. Participant 103 even openly said that in his

company the word intelligence was replaced by the word information; that way, in his words, “it is very different for my employees to understand that they must share information, but if I tell them to share intelligence they think that there is a hidden agenda and deny it.”

Only a few participants established that planning the implementation was a challenge, as affirmed by Simon (1947) when declaring that managers in higher positions will make a decision about what and employees have to make a how decision. This might be because of the fact that there were no BI implementations, only the use of readily available computer software that didn’t need any planning.

Finally, it is important to note that all officers were presented with the results, and all of them agreed that the conclusions were in line with their ideas. Some participants asked for a final copy of this study and to be kept informed of any new local or cheap systems that might be of interest to them.

Assumptions

The primary study assumption was that due to several economic and cultural factors, , there is limited knowledge and implementation of BI systems in companies in emerging economies such as Mexico. This assumption was confirmed by this study as CEOs indeed established a lack of knowledge in implementation. The different assumptions established in Chapter 1 were also confirmed.

Limitations of the Study

There were nine participants in this study, and to assume that these findings were valid for the entire country would be missing the nature of the qualitative research.

Interviews were done until saturation or new themes stopped emerging, which happened after the seventh interview. This limited number of participants could result in potential issues with validity and reliability. However, the sample of the participants in age, educational background, years of experience, and other demographics was broad enough to obtain reliable information as to the challenges and implications of the implementation of a BI system in Northern Mexico. The fact that the economy in the region where the study was made is mainly focused on one industry—and that there are many international companies located in this same region—might result in potential issues with transferability.

The different backgrounds of the participants could influence the way in which they expressed the limitations and challenges; these participants construct their values, perceptions, and conceptions about the reality they perceive and the challenges and implications they see. Nevertheless, some participants understood perfectly the concept of a BI system, while others had to be given a brief presentation on the subject, thus possibly limiting their ability to answer the questions from the interview.

As information technology evolves, IT systems will become less expensive and with globalization they will easily be localized into different languages, and their availability in emerging economies will be vast. The creation of new technologies that adapt to local cultures, as well as systems developed from zero with these local cultures in mind, might also create an issue with confirmability.

Recommendations

Based upon the study, I suggest the following recommendations for further research:

1. A study following Orantes (2011) in establishing the reasoning behind the lack of knowledge of basic theories on information systems.
2. A qualitative study of the cultural elements embedded within the philosophy of the northern Mexican workers. The study should be designed to identify the reasons behind the resistance to change and the struggle to adapt to new systems.
3. A study of basic education in emerging countries such as Mexico and its effects on future workers. This study might identify the reasoning behind the lack of culture for change and use of new technologies.
4. A study on the effects of economic volatility, especially to products imported from abroad, not only on IT investments but also on any major investment presented by a company.
5. A study on the different options for Mexican companies to invest in IT systems. This study might identify the reasons behind the lack, or perception of lack, of systems offered in Mexico and Latin America.
6. A study on the culture of people and its resistance to change in different regions of the country, in order to determine if the economic differences between these regions have a clear effect on the culture of the people.

7. A study on the effects of the political war waged in Mexico, to evaluate if this adversity to intelligence found in this study is consistent throughout the regions of Mexico.

Implications

This study provides substantial information related to the challenges and implications for small to medium companies in northern Mexico. First of all, it allows scholars to focus on new areas of research, as well as to use it as a stepping-stone into future research in a country in which these topics have not been fully researched. This research may help managers not only in northern Mexico but it can also be adapted to regional cultures in the rest of the country, so they can understand the factors behind an implementation and how they can avoid the challenges, or at least be informed about them before implementing a system.

The main theoretical implication of this study is that the implementation of BI systems in small to medium companies is not a simple phenomenon, but it involves different elements, such as economic restrictions, language barriers, and even cultural differences in accepting a new way of working. The results of the study allow an affirmation that the implementation of systems in small businesses is very different from multinationals like the Bimbo and Cemex cases previously analyzed. Because small companies have very limited resources, and usually deal exclusively with an internal market, the cost barriers, as well as cultural factors, should be considered within the theories of technology acceptance.

For organizations, the main implication of this study is that they need to assume that BI systems, like any other productive resource, are not a magic solution. There is no one recipe for an implementation for them to work. The volatile economy, as well as the culture of the people, must be taken into account in order to successfully implement a system. In consequence, those organizations that really aspire to obtain all the benefits of a BI system must adopt policies in line with the results of this research.

Another important implication is for system developers not only in the United States but also in Mexico. This research might aid them in understanding the reasons for the lack of implementations in this country, and how they can localize for the culture of the people, as well as revise their pricing structures in order to obtain a broader market with small to medium companies.

There are also policy implications that emerged from this study. Those in charge of education in Mexico can learn from this research that the students are not emerging from their systems with enough knowledge and aptitude to adopt new technologies. The use of information systems in school must be adopted in order to reduce the averseness to change reflected in the answers from the participants. Even though the language was not an important factor for an implementation, some participants mentioned it; thus, English programs must also be revised to ensure the students are ready for a global economy in which English is the native language.

Finally, as this study is added to the universe of academic information, it will help members of the information systems understand the implications that a system brings to an organization and how they can better implement them. By knowing there are

challenges and recognizing them, they can then be addressed in order to fully obtain the benefits of new technology in an emerging country such as Mexico. Through the use of new systems, new information will emerge, and different and better ways of doing things will make a better society.

Significance of the Study

As stated in Chapter 1, there was a lack of understanding of the challenges and implications of implementing a strategic BI system in companies in a country such as Mexico. Scholars will find significance in this study, as it can serve as a starting point for future research on the culture of the people, applied to the different technology acceptance theories discussed.

Business leaders in companies in Mexico may benefit from the findings of this study. By understanding the challenges and implications described in this study, they can better prepare their companies for a new system implementation, as well as calculate the economic risks involved.

Conclusions

The usage and implementation of IT systems in Mexico are scarce. There is not nearly enough information on how to successfully implement a BI system in a Mexican company. Through a phenomenological qualitative study, the perceptions of some CEOs regarding the challenges and implications of the implementation of such a system in their organizations were explored. An examination of the thoughts of CEOs revealed their lack of interest in BI systems and the reasons for such a lack of interest, as well as an examination of the thoughts and perceptions of such officers regarding the mentioned IT

tool. The economic volatility—as well as the local cultural barrier—must be addressed to fully implement a system in northern Mexico. The results of this study can be used to enhance current IT implementations in Mexican companies.

References

Aguilera-Enríquez, L., González-Adame, M., & Rodríguez-Camacho, R. (2011). Small businesses competitiveness model for strategic sectors. *Advances in Competitiveness Research, 19*(3/4), 58–73. Retrieved from http://www.researchgate.net/profile/Luis_Enriquez2/publication/268036355_SMALL_BUSINESSES_COMPETITIVENESS_MODEL_FOR_STRATEGIC_SECTORS/links/546014a40cf2c1a63bfdbf62.pdf

Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NY: Prentice-Hall.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211. doi:10.1016/0749-5978(91)90020-T

Al-Zubi, Z., Osama, S., & Alnaser, N. (2014). The effect of business intelligence tools on raising the efficiency of modern management accounting. *International Review of Management and Business Research, 3*(1), 68–77. Retrieved from http://irmbrjournal.com/papers/1389633161.pdf

Alshibly, H. (2015). Customer perceived value in social commerce: An exploration of Its antecedents and consequences. *Journal of Management Research, 7*(1), 17–37. doi:10.5296/jmr.v7i1.6800

Anyan, F. (2013). The influence in power shifts in data collection and analysis stages: A focus on qualitative research interview. *The Qualitative Report, 18*(36), 1–9.

Azita, S. S. (2011). An approach to building and implementation of business intelligence system in exchange stock companies. *Australian Journal of Basic and Applied*

Sciences, 5(6), 1491–1495. Retrieved from http://www.ijikm.org/Volume2/IJIKMv2p135-148Olszak184.pdf

Baker, S., & Edwards, R. (2014). How many qualitative interviews is enough? *National Center for Research Methods*, *4, 1*–43. Retrieved from http://eprints.ncrm.ac.uk/2273/4/how_many_interviews.pdf

Barakat, S. (2013). Business intelligence in the mobile era. *American Academic & Scholarly Research Journal, 5*(3). Retrieved from https://www.questia.com/library/journal/1P3-3016987201/business-intelligence-in-the-mobile-era

Barusch, A., Gringeri, C., & George, M. (2011). Rigor in qualitative social work research: A review of strategies used in published articles. *Social Work Research, 1, 11*–19. doi:10.1093/swr/35.1.11

Bhattacharya, A., & Kundu, A. (2013). Organization design and performance: Evidence from India. *International Journal of Management and Marketing Research, 6*(2)*, 93*–107. Retrieved from https://www.questia.com/library/journal/1P3-3109725201/organization-design-and-performance-evidence-from

Bergiel, B. J., Bergiel, B. J., & Bergiel, E. B. (2014). Are you listening to the people that count? *Competition Forum, 12*(2). Retrieved from https://www.questia.com/library/journal/1P3-3536725451/are-you-listening-to-the-people-that-count

Bertalanffy, L. (1972). The history and status of general systems theory. *The Academy of Management Journal, 15*(4))*, 407*–426. doi:10.2307/255139

Bressler, M., & Bressler, I. (2014). Protecting your company's intellectual property assets from cyber-espionage. *Journal of Legal, Ethical and Regulatory Issues, 17*(2),1–4. Retrieved from http://www.readperiodicals.com/201407/3567680951.html

Broekel, T., & Boschma, R. (2012). Knowledge networks in the Dutch aviation industry: The proximity paradox. *Journal of Economic Geography, 12*(2), 409–433. Retrieved from http://joeg.oxfordjournals.org/content/12/2/409.full.pdf+html

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., & Ciganek, A. P. (2012). Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty. *Computers & Education, 58*(2), 843–855. doi:10.1016/j.compedu.2011.10.010

Bruneau, T., & Dombroski, K. (2014). *Reforming Intelligence: The challenge of control in new democracies*. Monterey, CA: Dudley Knox.

Calderón, J. L., & Rodríguez, C. (2012). Un enfoque gerencial de los factores críticos para el éxito de los sistemas de informacion en la Pyme metalmecánica venezolana [A managerial approach of the critical success factors information systems in Venezuelan SMEs metalworking]. *Contaduría Y Administración, 57*(1), 79–102. Retrieved from http://www.researchgate.net/publication/260591351_Un_enfoque_gerencial_de_factores_crticos_para_el_xito_de_los_sistemas_de_informacin_en_la_Pyme_metalmecnica_venezolana

Carlson, J. (2010). Avoiding traps in member checking. *The Qualitative Report, 15*(5), 1102–1113. Retrieved from

http://nsuworks.nova.edu/cgi/viewcontent.cgi?article=1332&context=tqr

Cataldo, A., Mcqueen, R., & Sepulveda, M. (2011). Big IT for small companies. *Industrial Engineer: IE, 43*(5), 48–54. Retrieved from http://iienet.org/IEMagazine/Details.aspx?id=25180

Chen, E. (2012). Implementation issues of enterprise data warehousing and business intelligence in the healthcare industry. *Communications of the IIMA, 12*(2), 39–50. Retrieved from http://www.iima.org/index.php?option=com_phocadownload&view=category&download=385:implementation-issues-of-enterprise-data-warehousing-and-business-intelligence-in-the-healthcare-industry&id=63:2012-volume-12-issue-2&Itemid=68

Chu, H., & Yang, S. (2012). *Innovative semantic web services for next generation academic electronic library via Web 3.0 via distributed artificial intelligence*. Kaohsiung, Taiwan: Springer Berlin Heidelberg.

Churchill, S. (2012). Teaching phenomenology by way of "secondperson perspectivity" (From my thirty years at the University of Dallas). *Indo-Pacific Journal of Phenomenology, 12*(3), 1–14. doi:10.2989/ IPJP.2012.12.3.6.1114

Cibanal, L., Arce, M. C., & Carballal, M. C. (2010). *Técnicas de comunicación y relación de ayuda en ciencias de la salud [Communication skills and helping relationships in health sciences]* (2nd ed.). Madrid, España: Elsevier España.

Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.

Dalkir, K. (2013). *Knowledge management in theory and practice*. Oxford, England: Elsevier Butterworth-Heinemann.

Davenport, T., Harris, J., & Morison, R. (2013). *Analytics at work: Smarter decisions, better results*. Boston, MA: Harvard Business Press.

Davis, F. (1989). Perceived usefulness, perceived ease of use and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. Retrieved from http://www.jstor.org/discover/10.2307/249008?uid=3738664&uid=2&uid=4&sid=21106496283233

Davis, F., Bagozzi, R., & Warshaw, P. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003. Retrieved from http://home.business.utah.edu/actme/7410/DavisBagozzi.pdf

Deng, X., & Chi, L. (2012). Understanding postadoptive behaviors in information systems use: A longitudinal analysis of system use problems in the business intelligence context. *Journal of Management Information Systems, 29*(3), 291–326. doi:10.2753/MIS0742-1222290309

Eckerson, W. (2005). Business intelligence maturity model. *TDWI Poster*. Chatsworth, CA. Retrieved from http://www.eurim.org.uk/activities/ig/voi/03-01-06_Executive_Series_Assessing_Your_BI_Maturity.pdf

Ejiaku, S. (2014). Technology adoption: Issues and challenges in information technology adoption in emerging economies. *Journal of International Technology and Information Management, 23*(2), 59–68. Retrieved from http://www.iima.org/index.php?option=com_phocadownload&view=category&d

ownload=563:technology-adoption-issues-and-challenges-in-emerging-economics&id=88:jitim142&Itemid=77

Englander, M. (2012). The interview: Data collection in descriptive phenomenological human scientific research. *Journal of Phenomenological Psychology, 43*(1), 13–35. doi:10.1163/156916212X632943

Estévez, E. (2014). Comparing intelligence democratization in Latin America: Argentina, Peru, and Ecuador cases. *Democratisation of Intelligence, 29*(4), 552–580. doi:10.1080/02684527.2014.915177

Fernández, M., Bautista, T., & Sánchez, L. (2012). Estrategias para fomentar el uso de las TIC en la educación superior [Strategies to promote the use of IT in higher education]. In *VI Conferencia ACORN-REDECOM*. Valparaiso, Chile: Universidad Autonóma de México. Retrieved from http://www.acorn-redecom.org/papers/proceedings2012/026Fernandez_Espanol.pdf

Fernandez, P. (2013). *La profesionalizacion de las empresas familiares* [The professionalization of family firms]. Mexico, DF: LID Editorial.

Frels, R. K., & Onwuegbuzie, A. J. (2013). Administering quantitative instruments with qualitative interviews: A mixed research approach. *Journal of Counseling and Development, 91*(2), 184–194. Retrieved from https://www.questia.com/library/journal/1G1-325495868/administering-quantitative-instruments-with-qualitative

Galvin, R. (2015). How many interviews are enough? Do qualitative interviews in building energy consumption research produce reliable knowledge? *Journal of*

Building Engineering, 1, 2–12. doi:10.1016/j.jobe.2014.12.001

Gates, W., & Hemingway, C. (1999). *Business @ the speed of thought: Using a digital nervous system*. New York, NY: Warner Books.

Ghazanfari, M., Jafari, M., & Rouhani, S. (2011). A tool to evaluate the business intelligence of enterprise systems. *Scientia Iranica, 18*(6), 1579–1590. doi:10.1016/j.scient.2011.11.011

Gill, P. (2013). The implications of intelligence practice within and beyond the state: An analytical model. *Journal of Regional Security, 8*, 2. doi:10.11643/issn.2217-995X132SPG35

Giorgi, A. (2006). Difficulties encountered in the application of the phenomenological method in the social sciences. *Análise Psicológica, 3*(24), 353–361. Retrieved from http://www.scielo.gpeari.mctes.pt/pdf/aps/v24n3/v24n3a09

Glykas, M. (Ed.). (2013). *Business process management: Theory and applications*. New York, NY: Springer.

Goodhue, D. (1995). Understanding user evaluations of information systems. *Management Science, 41*(12), 1827–1844. doi:10.1287/mnsc.41.12.1827

Goodwin, B. (2011). Poor communication to blame for business intelligence failure. *ComputerWeekly*. Retrieved from http://www.computerweekly.com/news/1280094776/Poor-communication-to-blame-for-business-intelligence-failure-says-Gartner

Grant, R. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal, 17*(Winter Special Issue), 109–122. doi:10.1002/smj.4250171110

Gray, D. (2014). *Doing research in the real world*. London, England: Sage.

Green, J. (2015). *A history of political murder in Latin America: Killing the messengers of change*. New York, NY: State University of New York.

Guion, L., Diehl, D., & McDonald, D. (2011). *Conducting an In-depth Interview*. Gainesville, FL: University of Florida.

Gunther, R. (2013). *The end of competitive advantage: How to keep your strategy moving as fast as your business*. Boston, MA: Harvard Business Review Press.

Gurkov, I. (2013). Why some Russian industrial companies innovate regularly: Determinants of firms' decisions to innovate and associated routines. *Journal for East European Management Studies, 18*(1), 66–96. Retrieved from https://www.questia.com/article/1P3-2931404401/why-some-russian-industrial-companies-innovate-regularly

Heidegger, M. (2010). Introducción a la Fenomenología de la Religión [Introduction to Religion Phenomenology]. *Mexico, DF: Fondo de Cultura Económica*.

Hemmatfar, M., Salehi, M., & Bayat, M. (2010). Competitive advantages and strategic information systems. *International Journal of Business and Management, 5*(7), 158–169. Retrieved from http://www.ccsenet.org/journal/index.php/ijbm/article/download/6631/5247

Hislop, D. (2013). *Knowledge management in organizations*. Oxford, England: Oxford University Press.

Hočevar, B., & Jaklič, J. (2010). Assessing the benefits of business intelligence systems. *Management, 15*(1), 87–119. Retrieved from

https://www.efst.hr/management/Vol15No1-2010/5-Hocevar_Jaklic-final.pdf

Holloway, I., & Wheeler, S. (2013). *Qualitative research in nursing and healthcare*. Oxford, England: John Wiley & Sons.

Holzmann, G. (2005). Caracteristicas de un sistema de inteligencia estratégica para paises emergentes. Analisis y propuesta [Characteristics of a strategic intelligence system for emerging countries. Analysis and proposal]. In *Conferencia Sub-Regional de Seguridad Transacional y Gobernabilidad [Sub-Regional conference of transactional security and gobernability]*. Montevideo, Uruguay. Retrieved from: https://digitalndulibrary.ndu.edu/cdm/compoundobject/collection/chdspubs/id/1922/rec/10

Hosein, Z., & Yousefi, A. (2012). The role of emotional intelligence on workforce agility in the workplace. *International Journal of Psychological Studies, 4*(3), 79–79. Retrieved from https://www.academia.edu/6253784/A_Theoretical_Model_of_Workforce_Agility_Based_on_the_Theory_of_Planned_Behavior

Hou, C. (2012). Examining the effect of user satisfaction on system usage and individual performance with business intelligence systems: An empirical study of Taiwan's electronics industry. *International Journal of Information Management, 32*(6), 560–573. doi:10.1016/j.ijinfomgt.2012.03.001

Husserl, E. (1998). Invitación a la fenomenología [Invitation to phenomenology]. Barcelona, España: Paidós.

Iglesias, S., Hernandez, A., Pascual, F., & Dueñas, O. (2011). An analysis of the influence of students' technological culture on their technology acceptance. In *Cross-cultural aspects of learning technology acceptance.* Exeter, England: 14th Biennial EARLI Conference 2011: Education for a Global Networked Society. Retrieved from http://oa.upm.es/12424/2/INVE_MEM_2011_104780.pdf

INEGI. (2015). *Balanza comercial de mercancías de México [Mexico's trade balance]*. Mexico, D.F.: Instituto Nacional de Estadística y Geografía. Retrieved from http://www.inegi.org.mx/prod_serv/contenidos/espanol/bvinegi/productos/continuas/economicas/exterior/mensual/ece/bcmm.pdf

Information Builders. (2013). Top six worst practices in business intelligence. Retrieved from http://www.informationbuilders.com/about_us/whitepapers/download_form/download?sid=211477

Işık, O., Jones, M., & Sidorova, A. (2013). Business intelligence success: The roles of BI capabilities and decision environments. *Information & Management, 50*(1), 13–23. doi:10.1016/j.im.2012.12.001

Ivan, M. (2014). Characteristics of in-memory business intelligence. *Informatica Economica, 18*(3), 17–25. doi:10.12948/14531305/18.3.2014.02

Johnson, B., & Christensen, L. (2011). *Educational research: Quantitative, qualitative, and mixed approaches*. Thousand Oaks, CA: Sage.

Johnson, C., & Hackman, M. (2003). *Leadership, a communication perspective*. Long Grove, Ill: Waveland Press.

Keelson, S. (2012). A quantitative study of market orientation and organizational performance of listed companies: Evidence from Ghana. *International Journal of Management and Marketing Research, 5*(3), 104–114. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2162591

Keen, E. (1975). *A primer in phenomenological psychology*. New York, NY: Holt, Reinhart and Winston.

Koster, S. (2007). User acceptance of i-Music services. In *Twenty Student Conference on IT*. Enschede, Netherlands: University of Twente. Retrieved from http://referaat.cs.utwente.nl/conference/7/paper/6855/user-acceptance-of-i-music-services.pdf

Kvale, S. (1996). *Interviews: An introduction to qualitative research interviewing*. *quality*. Thousand Oaks, CA: Sage.

Landman, T. (2010). Violence, democracy and human rights in Latin America. In E. Desmond & D. Goldstein (Eds.), *Violent Democracies in Latin America*. London, England: Duke University Press.

Lapeña, Y. (2012). *Estudio fenomenológico de las relaciones interpersonales laborales [Phenomenological study of the interpersonal labor relations]*. (Unpublished doctoral dissertation). Universitat d'Alacant. Alicante, España. Retrieved from http://rua.ua.es/dspace/bitstream/10045/25772/1/tesis_Lape%C3%B1a.pdf

Laudon, K., & Laudon, J. (2012). *Management information systems*. New York, NY: Prentice Hall.

Lawrence, J. E., & Tar, U. A. (2010). Barriers to E-commerce in developing countries.

Information, Society and Justice Journal, 3(1), 23–35. Retrieved from http://eprints.londonmet.ac.uk/88/1/InformationSocietyAndJustice_v3n1_p23-35.pdf

Linares, N. (2012). Definición de la entidad inteligencia empresarial para un modelo de factoría aplicando inteligencia [Definition of business intelligence entity for a factory model using intelligence]. *Revista de Estudios En Contaduría, Administración E Informatica, 1*(2), 41–57. Retrieved from http://www.revistarecai.mx/index.php/recai/article/view/11

Lopez de la Torre, C. F. (2013). Miguel Nazar Haro y la guerra sucia en México [Miguel Nazar Haro and the dirty war in Mexico]. *Revista Grafia, 10*(1), 56–72. Retrieved from http://www.fuac.edu.co/recursos_web/descargas/grafia/grafia10/03.pdf

Loshin, D. (2012). *Business intelligence. The savvy manager's guide* (2nd ed.). Waltham, MA: Elsevier.

Luftman, J., & Zadeh, H. (2011). Key information technology and management issues 2010-11: An international study. *Journal of Information Technology, 26*(3), 193–204. doi:10.1057/jit.2011.3

Luhn, H. P. (1958). A business intelligence system. *IBM Journal of Research and Development, 2*(4), 314–319. doi:10.1147/rd.24.0314

Marshall, B., Cardon, P., Poddar, A., & Fontenot, R. (2013). Does sample size matter in qualitative research?: A review of qualitative interviews in IS research. *Journal of Computer Information Systems, 03*. Retrieved from http://iacis.org/jcis/articles/JCIS54-2.pdf

Masue, O. S., Swai, I. L., & Anasel, M. G. (2013). The qualitative-quantitative "disparities" in social science research: What does qualitative comparative analysis (QCA) brings in to bridge the gap? *Asian Social Science, 9*(10), 211–221. doi:10.5539/ass.v9n10p211

McKean, E. (2005). *The office professional's guide*. Oxford, England: Oxford University Press.

McKinney, K. (Ed.). (2013). *The scholarship of teaching and learning in and across the disciplines*. Bloomington, IN: Indiana University Press.

Merriam, S., & Tisdell, E. (2015). *Qualitative research: A guide to design and implementation*. San Francisco, CA: Jossey-Bass.

Mocanu, A. M., Litan, D., Olaru, S., & Munteanu, A. (2010). Information systems in the knowledge based economy. *Wseas Transactions and Business and Economics, 7*(1), 11–21. Retrieved from http://www.wseas.us/e-library/transactions/economics/2010/89-384.pdf

Moga, L., Constantin, D., & Valentin, M. (2012). A regional approach of the information technology adoption in the Romanian agricultural farms. *Informatica Economica, 16*(4), 29–36. Retrieved from http://www.revistaie.ase.ro/content/64/03%20-%20Moga,%20Constantin,%20Antohi.pdf

Montenegro, J. L. (2013, October). El CISEN en México: Entrevista con Jorge Carrillo Olea [CISEN in Mexico: An interview with Jorge Carrillo Olea]. *Newsweek En Español*. Retrieved from https://jluismontenegroj.wordpress.com/2013/10/14/el-cisen-en-mexico/

Morse, J. (1994). Designing funded qualitative search. In Denzin & Lincoln (Eds.), *Handbook of qualitative research* (pp. 220–235). Thousand Oaks, CA: Sage.

Muntean, M., & Surcel, T. (2013). Agile BI - the future of BI. *Informatica Economica, 17*(3), 114–124. doi:10.12948/14531305/17.3.2013.10

Myers, M. (2013). *Qualitative research in business and management*. New York, NY: Sage.

Navarro, A. (2010). *Political intelligence and the creation of modern Mexico, 1938–1954*. University Park, PA: Pennsylvania State University Press.

Nelson, J. A., Onwuegbuzie, A. J., Wines, L. A., & Frels, R. (2013). The therapeutic interview process in qualitative research studies. *The Qualitative Report, 18*(79), 1–27. Retrieved from https://www.questia.com/library/journal/1G1-350065640/the-therapeutic-interview-process-in-qualitative-research

Nilsson, M., & Gustafsson, J. (Eds.). (2012). *Latin America responses to globalization in the 21st century*. London, England: Palgrave McMillan.

Nistor, N., Lerche, T., Ceobanu, C., & Weinberger, A. (2011). The influence of culture and infrastructure availability on learners' technology acceptance. In *Cross-cultural aspects of learning technology acceptance*. Exeter, England: 14th Biennial EARLI Conference 2011: Education for a Global Networked Society. Retrieved from http://www.researchgate.net/publication/261884103_The_influence_of_culture_and_infrastructure_availability_on_learners_technology_acceptance

Olszak, C., & Ziemba, E. (2012). Critical success factors for implementing business

intelligence systems in small and medium enterprises on the example of Upper Silesia, Poland. *Interdisciplinary Journal of Information, Knowledge and Management, 7*(1), 129–150. Retrieved from http://www.ijikm.org/Volume7/IJIKMv7p129-150Olszak634.pdf

Orantes, S. (2011). Viabilidad del modelo de aceptación de la tecnología en las empresas mexicanas. Una aproximación a las actitudes y percepciones de los usuarios de las tecnologías de la información [Feasibility of the technology acceptance model in Mexican companies. An a. *Revista Digital Universitaria, 12*(1), 4–15. Retrieved from http://www.revista.unam.mx/vol.12/num1/art08/index.html

Orr, D. (2014). Systems thinking and the future of cities. *Post Carbon Institute*. Retrieved from http://www.postcarbon.org/system-thinking-and-the-future-of-cities/

Overgaard, S. (2015). How to do things with brackets: The epoché explained. *Continental Philosophy Review, 48*(2), 179–195. doi:10.1007/s11007-015-9322-8

Owen, G. (2014). Qualitative methods in higher education policy analysis: Using interviews and document analysis. *The Qualitative Report, 19*(52), 1–19. Retrieved from https://www.questia.com/library/journal/1P3-3382876971/qualitative-methods-in-higher-education-policy-analysis

Pascale, R. T., Millemann, M., & Gioja, L. (2002). *El líder en tiempos de caos: las leyes de la naturaleza y las nuevas leyes de los negocios [The leader in time of caos: the laws of nature and the new laws of business*]. Barcelona, España.: Paidós.

Patton, M. (2002). *Qualitative research & evaluation*. Thousand Oaks, CA: Sage.

Pietkiewicz, I., & Smith, J. A. (2012). A practical guide to using interpretative

phenomenological analysis in qualitative research psychology. *Czasopismo Psychologiczne, 18*(2012), 361–369. doi:10.14691/CPPJ.20.1.7

Polanyi, M. (1966). *The tacit dimension*. New York, NY: Anchor Day.

Popovič, A., Hackney, R., Coelho, P., & Jaklič, J. (2012). Towards business intelligence systems success: Effects of maturity and culture on analytical decision making. *Decision Support Systems, 54*(1), 729–739. doi:10.1016/j.dss.2012.08.017

Popovič, A., Turk, T., & Jaklič, J. (2010). Conceptual model of business value of business intelligence systems. *Management: Journal of Contemporary Management Issues, 15*(1), 5–29. Retrieved from http://www.efst.hr/management

Priest, D., & Arkin, W. (2011). *Top secret America: The rise of the new American security state*. New York, NY: Little Brown & Company.

Roberson, Q. (2013). *The Oxford handbook of diversity and work*. New York, NY: Oxford University Press.

Robles, J. (2005). Ventajas competitivas de ser una organización inteligente: El caso CEMEX [Competitive advantages of being an intelligent organization: The CEMEX case]. *El Cotidiano, 20*(130), 46–50. Retrieved from http://www.redalyc.org/articulo.oa?id=32513006

Rouhani, S., Ghazanfari, M., & Jafari, M. (2012). Evaluation model of business intelligence for enterprise systems using fuzzy TOPSIS. *Expert Systems with Applications, 39*(3), 3764–3771. doi:10.1016/j.eswa.2011.09.074

Rosso, D. (2012). Metodología para proyectos de Inteligencia de Negocio [BI projects methodology]. *Sistema de Inteligencia en las Pymes*. Retrieved from

http://www.sistemasinteligentespyme.com/2012/06/132-metodologia-para-proyectos-de.html

Rusaneanu, A. (2013). Comparative analysis of the main business intelligence solutions. *Informatica Economica, 17*(2), 148–156. doi:10.12948/issn14531305/17.2.2013.12

Ruvalcaba, J. C. (2014, July 15). Grupo industrial Bimbo [Bimbo enterprises]. *El Heraldo de Cordoba [Cordoba's Herald]*. Cordoba, Ver, México. Retrieved from: http://elheraldodecordoba.com.mx/opinion/9594-grupo-industrial-bimbo.html

Saldaña, J. (2013). *The coding manual for qualitative researchers* (2nd ed.). London: Sage.

Schütz, A. (1976). *The phenomenology of the social world*. London, England: Heinemann Educational Books.

Secretaria de Economia [Secretariat of Economy], Ley Para el Desarrollo de la Competitivad de la Micro, Pequeña y Mediana Empresa [Law for the development of the competitiveness of the micro, small and medium enterprises], 2012, Gobierno Federal [Federal Government]. Retrieved from http://www.diputados.gob.mx/LeyesBiblio/pdf/247_210115.pdf

Seidman, I. (2012). *Interviewing as qualitative research: A guide for researchers in education and the social sciences.* New York, NY: Teachers College.

Senge, P. (2006). *The fifth discipline: The art and practice of the learning organization*. New York, NY: Currency.

Shollo, A., & Kautz, K. (2010). Towards an understanding of business intelligence. *Australasian Conference on Information Systems, 21*. Retrieved from http://aisel.aisnet.org/cgi/viewcontent.cgi?article=1021&context=acis2010

Simeon, R. E. (2002). Inteligencia empresarial y la gestión del conocimiento [Business intelligence and knowledge management]. In *IntEmpres'2002*. La Habana, Cuba: Instituto de Información Científica y Tecnológica de Cuba [Cuba's Institute of Scientific Informationa and Technology]. Retrieved from http://www.redciencia.cu/empres/Intempres2002/Ponencias/AperturaRosaElenaSimeon.pdf

Simon, H. (1947). Administrative behavior, a study of decision-making processes in administrative organizations. *The Review of Politics*. New York, NY: The McMillan Co.

Sheppeck, M., & Militello, J. (2014). An exploratory study of organization design configurations in health care delivery organizations. *Journal of Health and Human Services Administration, 37*(1), 4–36. Retrieved from https://www.questia.com/article/1G1-378248961/an-exploratory-study-of-organization-design-configurations

Skinner, J. (2012). *The interview: An Ethnographic approach*. London, England: Berg.

Stevenson, A. (Ed.). (2010). *Oxford dictionary of English.* Oxford, England: Oxford University Press.

Summerville, K., & Dai, Z. (2012). Business process, financial performance and data management. *Competition Forum, 10*(2). Retrieved from

http://www.highbeam.com/doc/1P3-2823623061.html

Târnâveanu, D. (2012). A virtual community of practice proposal for business intelligence researchers. *Informatica Economică, 16*(3), 50–58. Retrieved from http://revistaie.ase.ro/content/63/05 - Tarnaveanu.pdf

Venkatesh, V., Morris, G., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward an unified view. *MIS Quarterly, 27*(3), 425–478. Retrieved from http://nwresearch.wikispaces.com/file/view/Venkatesh+User+Acceptance+of+Information+Technology+2003.pdf

Villatoro, P., & Silva, A. (2005). Estrategias, programas y experiencias de superación de la brecha digital y universalización del acceso a las nuevas tecnologías de información y comunicación (TIC). Un panorama regional [Strategies, programs and experiences in overcoming the digital divid. Politicas Sociales. Santiago, Chile: CEPAL. Retrieved from http://repositorio.cepal.org/bitstream/handle/11362/6094/S0412977.pdf?sequence=1

Walsh, R. I. (2012). On evidence and argument in phenomenological research. *Pacific Journal of Phenomenology, 12*, 1–7. Retrieved from https://www.questia.com/library/journal/1P3-3006980891/on-evidence-and-argument-in-phenomenological-research

Wertz, F. J., Charmaz, K., McMullen, L. M., Josselson, R., Anderson, R., & McSpadden, E. (2011). *Five ways of doing qualitative analysis*. New York, NY: Guilford

Press.

Wester, K. (2011). Publishing ethical research: A step-by-step overview. *Journal of Counseling and Development, 89*(3), 301–307. Retrieved from https://www.questia.com/library/journal/1G1-258356871/publishing-ethical-research-a-step-by-step-overview

White, D. (2009). BI or bust. *KM World, 18*(10), 16–26. Retrieved from http://www.kmworld.com

Wixom, B., & Watson, H. (2010). The BI-Based organization. *International Journal of Business Intelligence Research*, *1*(1), 13-28. doi:10.4018/jbir.2010071702

Woods, M. (2010). *Interviewing for research and analysing qualitative data: An overview*. Palmerston North, New Zealand. Retrieved from http://owll.massey.ac.nz/pdf/interviewing-for-research-and-analysing-qualitative-data.pdf

Zabludovsky, G. (2015). Las mujeres en los ámbitos de poder conómico y político de México [Women in the spheres of economic and political power in Mexico]. *Revista Mexicana de Ciencias Políticas Y Sociales, LX*(223), 61–94. Retrieved from http://www.redalyc.org/pdf/421/42132948003.pdf

Appendix A: Semistructured Interview Questions

Date:

Participant ID:

1. Presentation and thanking the participant for being part of the study.
2. This will be an anonymous interview in which you can feely expose your experiences and knowledge, although I will ask the questions to achieve the goal of this study: "To identify and understand the challenges and implications for a business intelligence implementation system in a Mexican company"
3. The duration of the interview will be approximately 1 hour. You can stop whenever you want, or do not answer any question that makes you feel uncomfortable. Your personal information will not appear anywhere except in my database, in which a nonidentification number will be assigned. This database will be kept in a personal safe for 5 years and will be destroyed afterwards. Do you have any doubts? Is there any question regarding this interview?
4. Can you provide some basic nonidentifiable demographic and educational information?, Age?, Highest educational level completed? If finished college what area is the degree on? How many years have you been the CEO of this company?
5. Let us begin: What would you consider to be your leadership style and why?

6. Would you view your organization as a system working together, or as a set of different departments?
7. Would you describe your organization as an entity that learns from its mistakes?
8. Do you believe the main source of information from your company is data obtained from information systems or what your employees bring to the workplace?
9. Do you believe that you as an officer of the company have enough abilities to make the best decisions or do you need technological tools to aid you?
10. How would you describe your knowledge of information technology, and its usefulness?
11. What would you describe to be the number one challenge presented by you when establishing information technology solutions in your company?
12. Would you describe the information systems currently implemented in your company as tools that aid you in making better decisions or just record keepers?
13. When launching a new idea or a new concept inside your company, what is the biggest challenge presented to you?
14. If I were to tell you that there are systems currently in the market that would allow you and your company obtain more information and make better decisions, what would your first thought be?
15. Would you like to add anything to the interview?

16. Thank you for your time, this is my contact information, and I will be sending you a copy of the results or if I need any clarification is it OK with you for me to contact you again.

Appendix B: Invitation to Participate

This invitation to participate is transcribed in Spanish, as it will be the language to which it will be presented to the participants.

Usted está invitado a participar en un estudio de investigación para conocer los retos e implicaciones de la implementación e un sistema de inteligencia de negocios en empresas en la ciudad de Saltillo, Coahuila. Este estudio se lleva a cabo solo a Directores Generales de PYMES en la ciudad. Esta forma es parte de un proceso llamado consentimiento de información para permitir que usted entienda este estudio antes de decidir si tomar parte de el.

Este estudio está siendo realizado por un investigador llamado Héctor de Jesús Rivera Ochoa, quien es un estudiante de doctorado en la Universidad de Walden en los Estados Unidos.

Antecedentes:

El propósito de este estudio es comprender las razones por las que una empresa en la ciudad de Saltillo, Coahuila México no hace inversiones importantes en la implementación de un sistema de inteligencia de negocio. Es conocer si el empresario conoce de dichos sistemas y si no es así que seria importante que un sistema con este nombre pudiera traer de beneficio a su empresa.

Procedimiento:

Si acepta participar en este estudio, se le pedirá:

• Participar en una entrevista de aproximadamente 45 minutos en una ubicación de su

preferencia. Sin embargo, ese lugar debe estar completamente privado. Esto no va a tener lugar en un área pública.

• Más adelante tarde pedirá que conteste un e-mail en el que se le pedirá su opinión sobre los resultados que se obtuvieron después de analizar los datos de todos los participantes.

He aquí algunos ejemplos de preguntas:

1. ¿Cómo describiría lo que usted cree es la inteligencia de negocios?

2. ¿Como cree que un sistema de inteligencia de negocios pudiera ayudar en su empresa?

3. Para su entendimiento, cree que los sistemas de información ayudan o perjudican a el trabajo diario de su puesto como director general de una empresa

4. Que porcentaje de sus ingresos empresariales dedica al departamento de sistemas.

a. ¿Cree que es suficiente?

b. ¿Estaría dispuesto a invertir una mayor cantidad si los resultados fueran claros?

c. ¿Como cree usted que se debe calcular el retorno de una inversión en sistemas de información?

Naturaleza Voluntaria del Estudio:

Este estudio es voluntario. Todo el mundo va a respetar su decisión de si participa o no opta por participar en el estudio. Nadie en la Universidad Walden lo tratará diferente si decide no participar en el estudio. Si decide participar en el estudio ahora, usted todavía puede cambiar de opinión más tarde. Usted puede parar en cualquier momento.

Riesgos y beneficios de participar en el estudio:

Estar en este tipo de estudio no implica ningún riesgo. El estudio ofrece beneficios sociales para su comunidad y el país, ya que proporcionará información científica con el fin de ayudar a los académicos, y a los especialistas en sistemas así como directores generales de tener una idea más clara de las ventajas y desventajas de la implementación de un sistema de información.

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Contactos y Preguntas:

Puede hacer cualquier pregunta que tenga ahora. O si usted tiene preguntas más tarde, puede comunicarse con el investigador a través de él llamando al (844) 4502100 Ext 2667, o enviando un correo electrónico a hector.rivera@waldenu.edu.

El investigador le dará una copia de este formulario para llevar.

Declaración de Consentimiento:

Pago:

No habrá ningún pago por su participación en este estudio.

Política de privacidad:

Cualquier información que usted proporcione será confidencial. No se utilizará su información personal para ningún propósito fuera de este proyecto de investigación. Además, el investigador no incluirá su nombre o cualquier otra cosa que usted pueda identificar en los informes de los estudios. Los datos se mantienen seguros colocándolo dentro de una caja de seguridad dentro de una oficina privada. Los datos se conservarán durante un período de al menos 5 años, como es requerido por la universidad

English version:

You are being invited to participate in a research study to identify the challenges and implications of a business intelligence system implementation in companies in the city of Saltillo, Coahuila. This study was carried out only to CEOs of SMEs in the city. This form is part of a process called informed consent to enable you to understand this study before deciding whether or not to take part in it.

This study is being conducted by a researcher named Hector de Jesus Rivera Ochoa, who is a doctoral student at Walden University in the United States.

Background:

The purpose of this study is to understand why a business in the city of Saltillo, Coahuila Mexico does not make significant investments in the implementation of a business intelligence system. It is to know if the employer knows of these systems and if not what would be important for a system with this name that could bring benefit to the company.

Procedure:

If you agree to participate in this study, you will be asked:

• To participate in an interview about 45 minutes in a location of your preference. However, it should be completely private. This will not take place in a public area.

• You will then receive an e-mail in which you are asked your opinion about the results obtained after analyzing data from all participants.

Here are some sample questions:

1. How would you describe what you believe is Business Intelligence?

2. Do you think that a business intelligence system could help your company?

3. Do you believe an information system will help or hinder your daily work as CEO of the company?

4. What percentage of your business income is dedicated to the IT department.

a. Do you think that's enough?

b. Would you be willing to invest a larger amount if the results were clear?

c. How do you think that the return on investment for an information systems should be calculated.?

Voluntary nature of the study:

This study is voluntary. Everyone will respect the decision of whether or not to participate in the study. No one at Walden University will treat you differently if you choose not to participate in the study. If you participate in the study now, you can still change your mind later. You can stop at any time.

Risks and benefits of participating in the study:

Being in this kind of study does not involve any risk. The study provides social benefits for their community and the country, as it will provide scientific information to help academics, and systems specialists and general managers have a clearer idea of the advantages and disadvantages of implementing an information system.

Contacts and Questions:

You can ask any questions you have now. Or if you have questions later, you may contact the researcher through it by calling (844) 4502100 Ext 2667, or sending an email to hector.rivera@waldenu.edu.

The researcher will give you a copy of this form to keep.

Payment:

There will be no payment for your participation in this study.

Privacy Policy:

Any information you provide will be confidential. Your personal information for any purpose outside of this research project will never be used. In addition, the researcher does not include your name or anything else that can identify you in the study reports. The data is kept secure by placing it inside a safe in a private office. The data is kept for a period of at least five years, as required by the university

Appendix C: Preexisting Coding Categories

Knowledge origin

General system theory

Great quotes

Knowledge in IT

Decision Makers

Leadership style

Main reasons not to invest in IT

Main IT Challenges

Smart organization