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&

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The impact of projects and operations management on risk reduction for the international construction firms.

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Jessica Melhem Ghaoui

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Approval Certificate

The impact of projects and operations management on risk reduction for international construction firms.

BY

Jessica Melhem Ghaoui

Approved:

Signatures:

Dr. Ali H. Harb

Supervisor 18/7/2012

_____

Reader

NDU MBA/MIB Academic Committee: _____

_____

MBA - MIB Program
FBAE

Assistant Dean, FBAE

Bordeaux Management School: _____

_____

Date

DECLARATION

I hereby declare that this Thesis is entirely my own work and that it has not been submitted as an exercise for a degree at any other University.

Jessica Melhem Ghaoui

ABSTRACT

Contracting overseas construction projects is usually considered a 'high risk business', mostly because of a lack of adequate overseas environmental information and overseas construction experience .Managing risk is one of the primary objectives of firms operating internationally, nevertheless, the treatment of risk and uncertainty in the international management firm vary in their use of those terms and tend to look at particular categories of risk.

In recent years, owners and contractors have aggressively pursued international business opportunitics and projccts, but in thc facc of thc dcvclopmcnt risks may go unidcntificd and carly warning indicators ignored. It is therefore assumed that every business organization have to develop a risk management system and an internal coordination systems in order for the organization to continue running.

The goal of this research study is to develop a risk management process to increase the success of international facilities for owners and contractors, its important to note that these techniques are relevant to all organizations even outside the construction companies.

This research is a study of a existing problem that every organization go through, even the ones that aren't related to the construction fields, where the main purpose is to ensure that the lack of communication and coordination between the departments will certainly lead to failure of the whole organizational system. Particular attention was directed at how the two parties of the company coordinate to reduce the risk in the international construction fields using software's and/or other tools.

Primary and secondary data have been gathered through qualitative and quantitative data, questionnaires was used to collect primary data information from which the risk was the dependent variable and all the rest means were taken as an independent variables.

At the end of the study, it is important to note that risk management is the art and science of planning, assessing and handling future events to ensure favorable outcome that's why necessary procedure must be developed to early recognize risk and try to prevent it.

Key words: Risk management, operation management, project management, international construction projects, project life cycle, risk assessment.

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INTRODUCTION

1.1 General background of the subject

One of the principal ways in which modern societies generate new value is through projects that create physical assets which are exploited to achieve social and economic ends. Today, managers are compelled to make the production process as fruitful as possible; that is true especially for companies operating in developed countries where markets are becoming highly competitive.

The construction industry is one of the most booming industries in the world; however, many projects reach undesired ends mainly when firms embark on international ventures. In such situations ''risk management'' becomes a critical part of the project management process as ''unmanaged or unmitigated risks are one of the primary causes of project failure'' (Royer, 2000).

In today's complex and globalized economy the notion of effective project management is required more than ever. In any enterprise the core and vital objective is a vigorous profit that is essential for motivation. Therefore, project management issues are driven by the desire for capability expansion as well as productivity improvement and enhancement. "In addition, the main target of project management is not only to achieve a healthier profit margin and higher market shares than the competitors, but it is to ensure a sustainable success of managing the project and knowing that the firm's agility is superior to that of their competitors". (Parviz F. Rad, 2010

Operations management is mostly responsible for the profits and losses of the company in all aspects of the business and its developed budgets. It considers the acquisition, development, and utilization of resources that firms need in order to deliver up to the level goods and services their clients want. It is defined as "the process of designing, planning, controlling and executing operations in manufacturing and service industries" (Fransoo, 2002).

New situations are beginning to appear in today's business environment as a result of disappearing boundaries between countries, especially those businesses having geographically dispersed teams working in different time zones, locations and across cultural borders. These recent developments are certainly presenting some remarkable new opportunities while posing unfamiliar personal, professional and corporate challenges.

Construction projects are initiated in a complex and dynamic environment resulting in circumstances of high uncertainty and risk. It is important to understand that all projects carry out risk through uncertainty; therefore it is essential to use the concept of project risk management to introduce the adequate mechanisms that are concerned with analyzing, identifying, and responding to project risk. It is also crucial to note that when operating internationally, a company should carefully consider its mission, objectives and strategies; the primary focus should always fall on the individual who carries the lead responsibility for all the associated planning and follow-up.

Identifying project risk at early stages helps improving the overall risk management process using productive methods linked to the project's strategic decision-making lifecycle, along with effective methods of presenting and using the data.

Due to the researcher's nature of work as a senior project consultant, and due to the crucial link between the projects and operations management, and the necessity to assess, monitor and control the various aspects of the project managing documentation and communication activities - where it is necessary that project management and

operations structure themselves meet similar objectives - the researcher decided to emphasize this study on project risk management in this specific field of construction operations.

For the fact that the link between the above mentioned management style is within the art and science of planning, assessing, and handling future events in order to ensure favorable outcomes with the minimum risk, this research will focus on evaluating Sayfco Holdings as the case construction company. Some research questions will be raised to many of the company's architects, engineers, contractors and managers.

1.2 Need and importance of the study

Organizations are more likely to plan diligently in order to deliver international ventures with a more comprehensive understanding of the commercial, political, construction and operations uncertainties of the projects; However, efforts to identify and assess the risks associated with capital facilities are difficult to perform and few management tools or techniques are available to identify, assess, and help manage the risks.

Within the international context, construction can be a very complex business and the risks involve a multitude of issues. Furthermore the wide-range of locations, diversity of project types, and the number of organizations involved, make it difficult to clearly define an international project; and the ability to control or supervise such projects is currently a major concern among construction managers.

It is very important to understand how every unit or department of the organization can work and coordinate to achieve a maximum project success; thus, a biography of the fields must be considered aimed at identifying their origin and development through time.

Project management and operations should be structured in a way that allows their objectives to be met; therefore establishing a link among departments in a comprehensive manner will provide us with clear criteria of the whole project life cycle from the very early phase of the project's inception in the mind of the developer to the final stages of construction until the project is completed.

1.3 Purpose and objective of the study

The key objective of this study is to understand the relationship between the project management factors and the operations performance in international construction projects and to be able to understand the problems faced by the project managers when dealing with such situations, and how these problems could be reduced through the useful coordination and collaboration between all the participating departments, especially the above mentioned.

While international projects may appear as attractive investments, such projects usually involve an elevated level of risks, and the successful delivery of such projects has proven to be difficult; because risk is a dynamic event across the project life cycle, and the understanding of this life cycle is essential for all who are associated with the construction industry, especially to the entire globalization factors that left many of the organizations confront with the business world challenges. These days the ultimate aim of organizations is to have competitive advantages through their innovative techniques.

Therefore shaping the consequences so that the project goals are met is essential in this study; it is also crucial to identify factors that influence project outcomes or measure the project success addressing both tangible and intangible measures like "cost performance and time" for tangible factors "effectiveness of communication" for the latter . These measures enable the company to identify the nature of the working relationship among all parties and the way it affects the overall performance of the project.

1.4 International perspective

International projects are defined as those where the owner and/or contractor are from a country different from that where the project is situated and it involves a wider range of issues than domestic projects. In fact, moving outside of one's usual business authority interposes many unknowns.

In the unfolding scenario, firms need to learn how to compete and adopt strategies that give them market shares that are no longer geographically limited.

The execution of an international project can be difficult at times and often an uncertain process. Moreover these difficulties are often compounded by the presence of constraints on time, resources and performance, and are frequently heightened by the conflicting objectives of the parties involved. Therefore, the need for efficient and effective project management has led to develop a variety of management techniques to reduce the implication of risk.

1.5 Brief overview of all chapters

The study of the risk management and the collaboration between parties in any field is currently one of the most heavily researched areas, thereby the coming chapters will be divided in order to offer a clear perspective about the whole subject.

In the first chapter of the paper, a general overview about the definitions concerning project and operation management, the need and purpose of the study is elaborated, and for a better understanding of the subject an international perspective is taken into consideration.

In the second chapter, the researcher will be conducting a literature review that details the following: the notion of construction management, the operation management as conducted internationally or locally, the concept of risk and how it influences the

construction fields, the execution of a project planning and control, and finally an emphasis on how important the link between operation and project management is.

In the third chapter, we will be presenting the research methodology of the dissertation; it will include the questionnaire design, and a sample size made out of 60 selected participants. In the last segment of our methodology, the quantitative data collected using the questionnaire and the qualitative data collected from the plant by observation will be combined to get to the final results. An overview about Sayfco Holding will be taken into consideration for a better understanding of the findings.

The fourth chapter deals with the analyses of the data collected to evaluate the relationship between the departments, the operation and project management, and how the risk affects every situation of the project, being technical, financial and otherwise.

In the last chapter, conclusion and recommendations for future research will be posed, as well as the limitation of the research and what made it difficult to reach some information and what the managerial impacts of this study are.

Chapter 2

LITERATURE REVIEW

2.1 Introduction

The art and science of project management plays a major role in reducing the risk which is consequently becoming a critical factor that must be taken into consideration for the prosperity of the project. In this age of globalized services and industries, organizations are continuously asked to bridge cultural, geographical, and functional boundaries effectively and efficiently

Every project goes through a series of identifiable phases where it is "born", it matures, it carries through the old age and it 'expires' (Bennett, 2003) .

The study of ''risk management'' is one of the most heavily studied research areas of organizational behavior. Even though it has been often discussed in business circles, only few strategies have been put forward to run it effectively. Nowadays with all the new technologies available in the global environment, collaboration has become a central part of the process.

The recent changes in international markets are of great importance, many markets have recently become deregulated with the reduction in trade barriers. Thus we notice that international business is offering companies new markets; at the same time we realize that the growth of international trade and investments has become larger than the growth of domestic activities.

Many companies now operate in many different countries with different political, financial and economic systems. However, the heterogeneity of the environment in which companies operate plays a strong influence on their risk exposure; therefore to assess and manage the risk we need to understand the instability of the global marketplace.

2.2 Management of construction

Construction, and the ability to build things, is one of the most ancient of human skills. In prehistoric times it was one of the talents that set Homo-sapiens apart from other species. Any where you visit throughout the world today, there is high probability you will come across some types of construction taking place: whether it is about the construction of new schools, roads, buildings, bridges, shopping centers, restaurants, or other subdivisions.

According to the Construction Management Association of America (CMAA), ''Construction Management is a professional management practice consisting of an array of services applied to construction projects and programs, through the planning, design, construction and post construction phases, for the purpose of achieving project objectives including the management of quality, cost, time and scope ". We can say that it is a discipline, as well as a management system, specifically created to promote the successful execution of capital projects for owners. Certainly these projects can be highly complex and few owners tend to maintain the staff resources necessary to pay a continuing attention to every detail--yet these details can "make or break" a project; however communication of construction project risks is poor, incomplete and inconsistent through the construction supply chain. (J.H.M Tah, 2001)

Construction industry is one of the most booming industries in the world, and it has changed dramatically in the past few years. Building construction is procured privately or publicly utilizing various delivery methodologies, including hard bid, negotiated price, traditional, management contracting, construction management-at-risk, and design-build bridging. Accordingly, the construction company has become a complex process, which involves different levels of education and experience; yet the construction worker must be ready to operate around the clock because of problems like bad weather, delays, and project deadlines.

Construction can be described as the creative efforts that convert the four M's of the construction **"Materials, Manpower, Machines, and Money"** into a constructed facility. It is field and project oriented, producing unique products rarely suited to mass production or a controlled manufacturing environment.

Risk in construction has been the object of attention because of time and cost overrun associated with construction projects. It is generally recognized that those within the construction company are continually faced with a variety of situations involving many unknown, unexpected, frequently undesirable and often unpredictable factors. (Malcolm J MacLeod, 1997). Through the whole process, the construction manager is the one responsible of all the thinking and planning.

The management of construction is in itself an enterprise that involves many people with diverse interests, talents and background. The owner, the design professional and the contractor compromise the primary triad of parties (Bennett, 2003). This is a major worldwide industry accounting for approximately US $3.4 trillion, or almost ten percent of the global Gross Domestic Product (Batchelor, 2000)

Without any doubt construction is a big business. The industry's significant impact on the world economy can be demonstrated by reviewing constructions proportion of the total value of goods and services as well as the number of people employed in the construction, as a proportion of the total workforces, and the number of construction firms compared with the total business in all industries (Bennett, 2003). We cannot deny that construction is an information and knowledge driven industry that is challenged by high cost pressure, shortened project cycles and increasing competition (Ribeiro, 2008).

Our objective in this chapter is to better understand the management of construction by emphasising on the project lifecycle. It concerns the sequence of phases that defines the overall process from the start point to the end point of the project, defining the

roles of the people responsible for the many activities, from the time of its inception to the culminating phase of the site, which will be elaborated in the next coming points.

2.3 Operation management

In order for professional managers to fulfill strategic roles within business and construction enterprises, the need for a practice of operations management is necessary and cannot be forgone. Operations management is very important in business construction since it constitutes the heart of the organization by controlling the system of operations. This type of management deals with the design, operation, and improvement of the systems that create and deliver a firm's primary products and services. As marketing and finance, operations management is a functional field of business with clear management responsibilities.

The below figure 1 shows how officers in operations management use the various inputs and transform them into goods and services

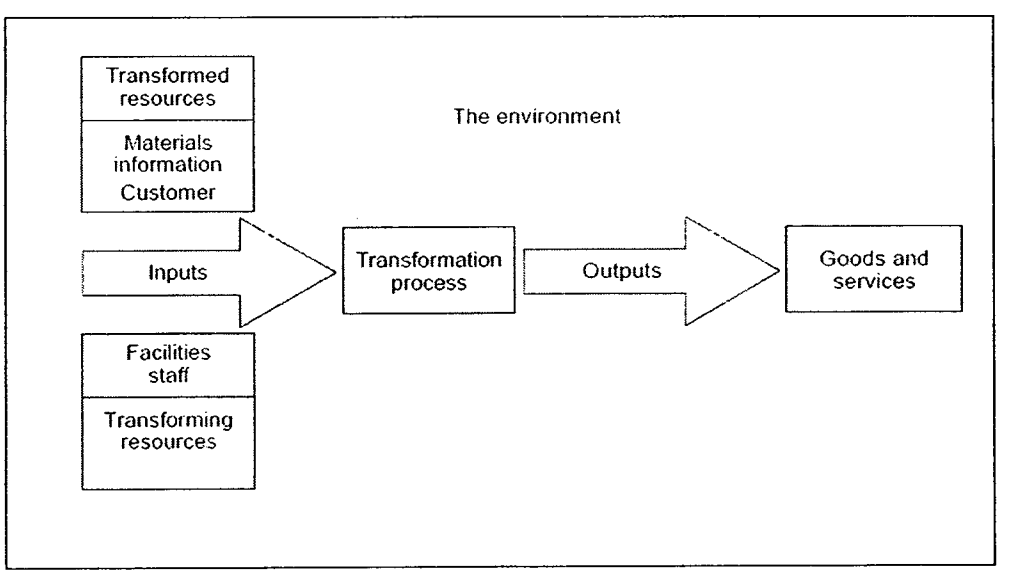

Figure 1 Inputs to the transformation process
Source: (Colin Armistead, 1994)

2.3.1 Definitions and roles of operation management

Operations management is defined as the process of designing, planning, controlling and executing operations in manufacturing and service industries (Fransoo, 2002), it describes inputs being transformed into outputs within the boundary of an operation system. Operations management is the activity of managing the resources which are devoted to the production and delivery of products and services. Working effectively with the other parts of the organization is one of the most important responsibilities of the operations management. It is fundamental of modern management that functional boundaries should not hinder efficient internal process. (Nigel Slack S. C., 2010)

We have to keep in mind that operations managers have a key role to play in managing their inter-organizational relationships. Eventually this kind of business relationships matters most, and without them organizations have difficulty contracting resources or capability, acquiring supplies, managing supply chains, solving customer problems or generating revenues.

Operations management could be both exciting and challenging; on the one hand we see that it is at the centre of numerous changes affecting the business world, while on the other hand, it is also promoting the creativity which will allow organizations to respond to many changes; this is becoming the prime tasks of operations managers. Hence, superior performance depends on the ability of the firm to innovate, protect knowledge resources and transform them across the organization (Ribeiro, 2008) .

Every entreprise needs raw materials and services to keep its operations running, and operations management would enable the enterprise to procure quality goods and services at a reasonable cost and follow up with the whole process until the final phase of the project.

2.3.2 Operations management and operations managers.

Operations play an important role in all the activities required to create and deliver an organization's goods or services to its customers or clients. It is an important functional area, because it plays an important role in determining how well an organization satisfies its customers. Managers should have a great ability to work well with a wide range of people, resolve problems quickly, and most importantly share information and experience among the staff.

Since Operations Management is all about efficient and effective running of production, an operations manager's purpose is to find out ways by which the company can become more productive.

Operations managers need to manage manufacturing and service operations efficiently and effectively in order to be able to lead to a considerable interest increase in operations management. Their role is to direct responsibilities and it includes managing the operations process, embracing design, planning, control, performance improvement, and operations strategy.

Operations manager responsibilities include:

- Designing the operations system
- Managing the operations system
- Improving the operations system
- Human resource management
- Asset management
- Cost management

Being able to define what comes first and what is more important to achieve in the first stages remains very essential, because with the start of construction operations in the fields, the project cycle begins to take on a different focus, and several responsibilities start to be performed, especially those that concern monitoring and controlling of the whole process.

Managing resources effectively, coordinating the vital documentation and communicating activities is necessary to know which phase comes first and which one comes last, based on the importance of the priorities (Bennett, 2003). This is the reason that makes operations managers mostly emphasize on monitoring and controlling the various aspects of the project.

On the other hand, one of the most important reasons and the main condition for tracking the project is the schedule updates, where the purpose is to determine whether the activities planned were actually active and their progress is up-to-date. When controlling the project schedule, it is essential that actual performance be compared with planned performance (Bennett, 2003). In this way operators are able to set their spot in the timetable and act accordingly to remedy any deficiencies.

Another main point that should be added and monitored is the need to incorporate any new information about new work that was not previously planned, and to determine their impacts on the overall project completion date. The network based project schedule provides a periodic monitoring and control in order to evaluate the progress of each activity (Bennett, 2003).

Still, despite all the safety programs, construction remains a hazardous business; accidents and other serious problems continue to take place at the various stages of work. If safety is ignored, projects may be completed more quickly, and if the environment is not protected, cost may be lower "at least in the short run"; however, these constraints are very real in the construction management and we have to deal with them daily

The economic challenge in controlling project safety is to balance all the risk elements by lowering their sum.

Productivity in the construction industry is a major concern among all segments, it is the efficiency by which materials are handled or placed by labor or equipment. Many factors related to labor can cause wasted time and low productivity when improperly managed; therefore some of them must be taken into consideration such as: training employees, working conditions, motivation, programming and schedule control, and materials management.

2.4 International operations

International businesses operate in an environment shaped by local governments, competitors, consumers, suppliers, and international factors; it is within this business environment that organizations function and have to determine strategies and a modus operandi that allow them to meet their organizational goals in ways that comply with the relevant legal and regulatory frameworks as it is always important to expand markets to ensure the long-term, sustainable growth of your business.

When establishing international business operations, cannot over generalize when trying to establish firm's most important business objectives. One has to consider the concept of ''emerging'' versus ''mature markets'' and ''stable'' versus ''unstable markets'' (Schreiber, 2003)

When entering a new market it is necessary to find some competitive advantage that can differentiate a firm's offerings from those of others; therefore one must be able to function as a manager to introduce staff to all these changes and motivate them to be able to innovate and act accordingly. Many major elements play an important role in the success of international operations management. There should be an initial commitment to the whole project, where the communication with capital provider remains clear and accurate; but the most essential factor is to both integrate the right people in the new culture and ensure they can cope to the changes.

2.5 Project management

2.5.1 What is the role of project management?

Project management forms an important part of the operations manager's day; it is about the tasks for all the company planning, creating time lines, organizing regular meetings, and keeping the team on track. The success parameters for any project are on time completion, within specific budget and with requisite performance. One of the main barriers for their achievement are the changes in the project environment. The problem multiplies with the size of the project as uncertainties in project outcome increase with size. (Dey, 2010)

According to Hanghey (PMP, 2009), project management in the modern sense began in the early 19th century. The need for project management was driven by business that realized the benefits of organizing work around projects and the critical need to communicate and coordinate work across departments and professions. In other words, it is all about creating an environment and conditions in which defined goals and objectives can be achieved in a controlled manner.

Project management has a definite beginning and end. Thus it is not a continuous process, and uses various tools to measure accomplishment and track project tasks: it reduces operational risks and increases chances of success.

Kernzer (**2009**) affirms that project management is a systems approach to planning, scheduling, and controlling. He further states that "a successful project management can be defined as having achieved the project objectives within time, cost, at the desired performance while utilizing the assigned resources effectively and efficiently". He adds that it is designed to make better use of existing resources by getting work to flow horizontally and vertically within the company.

It is obvious, that many authors tried hard to put the words together and come up with the best definition for project management; thus Kernzer (**2009**) provides a narrow definition for the project management when he defines it as the planning, organizing, directing and controlling of company resources for a relatively short-term objective that has been established to complete specific goals

With the definitions mentioned, it is essential to know that the field of project management began to grow; along time it matured with the emergence of project management societies such as the "Project Management Institute'', which defined the concept as being "the art of directing and coordinating human and material resources throughout the life of a project by using modern management techniques to achieve predetermined objectives of scope, cost, time, quality and participation satisfaction.'' (Project Management Institute)

Naturally projects are at the core of all management activities because they directly contribute to the operational and financial success of the organization; they are vital to the strategic plan and its operationalization (Parviz F. Rad, 2010)

According to Furst (2010), project management is the art and discipline of planning, organizing, controlling, and managing human and material resources throughout the life of a project, so as to achieve its the successful completion.

A project management is the science and art of organizing the components of a project, but the process of project management does not necessarily stop there as it continues to include managing the implementation of the project plan, along with operating regular controls to ensure that there is accurate and objective information on performance relative to the plan and the mechanisms to implement recovery actions when necessary.

Projects usually follow major phases or stages including feasibility, definition, project planning, implementation, evaluation and support/maintenance. They are also defined

as unique and impermanent activities with altering manpower that are usually short term. So project members must respond rapidly to new situations in their tasks. (Mostafa Jafari, 2011)

The basic ingredients of the project management could be summarized in a triangle. The main three major factors are cost, time and scope. The project has to meet the customer quality requirements, thus the manager has to make sure that it is within cost, it will be delivered on time and within scope.

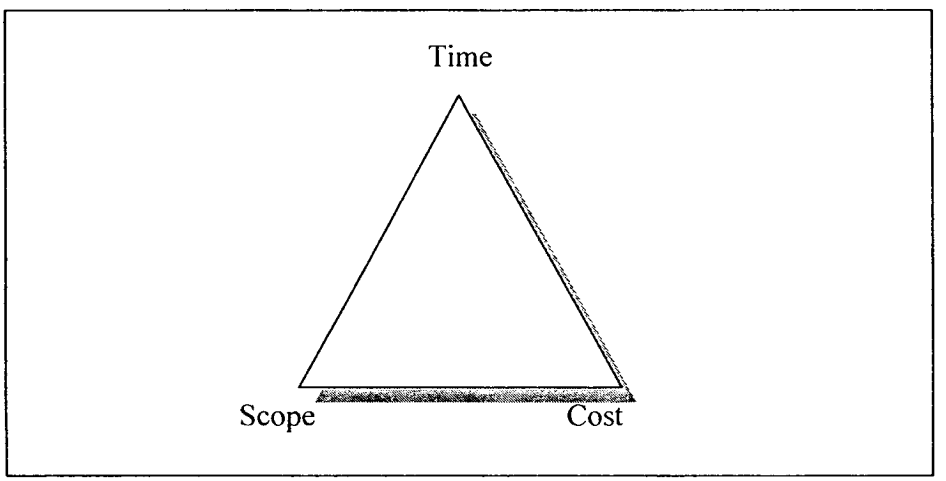

Figure 2: Project Management Triangle
Source: (Bennett, 2003)

There are 3 main interdependent constraints for every project: time, cost and scope; failing to meet set deadlines can create bad effects, as in some cases insufficient resources might necessitate more time, second when talking about the scope we have to note that looking at the outcomes of the project undertaken plays a major role, and finally it is essential to have an estimated cost that project managers should work on. Project managers need to understand that the three constrains outlined in the triangle can be adjusted but the importance of the entire scenario is to strike a balance between them so that quality is never compromised.

The role of a project manager lies where new scenarios, such as having geographically dispersed teams working in different time zones, locations and across cultural borders present tremendous new opportunities – while posing uncharted personal, professional and corporate challenges. Effective management and leveraging of knowledge can drive an organization to become more adaptable, innovative and intelligent (Tseng, 2007), that's the reason why project magagers should have the potential to improve the firm's values by enhancing their ability to quickly respond to new and unusual business situation.

Each construction project has its own technical characteristics that vary according to the construction type, execution time and environment. This leads to a different risk atmosphere for each construction project (Ahmet Oztas, 22 October 2004). Risks arise from uncertainty where most of the issues impact a project. Project managers can reduce risk considerably, often by holding to the policy of open communication, guaranteeing that every significant participant has an opportunity to express his opinions and concerns, and their decisions should be taken in such ways that directly benefit the project, they might use the help of some software to help them control and organize all the tasks and workforce.

2.5.2 Importance of project management

The survival of many companies depends on project management. This is true especially for construction firms. In today's business environment, objectives and targets achievement is becoming a more difficult task. For instance, many studies have shown that companies that lack controlling and planning are more exposed to failure and risks resulting in delays due to ineffective project planning coordination, risk management and monitoring, in addition to some customer dissatisfaction due to lack of communication and responsiveness. (Lavagnon A. Ika, 2009)

Applying effective Project Management for the deployment of strategy and the attainment of goals can thus provide organizations with many advantages; thereby the decision making is the essence of the project manager's job. A process of 8 eight steps must be identified:

- Identification of the problem
- Identification of decision criteria
- Allocation of weights to criteria
- Development of alternatives
- Analysis of alternatives
- Selection of an alternative
- Implementation of the alternative
- Evaluation of decision effectiveness

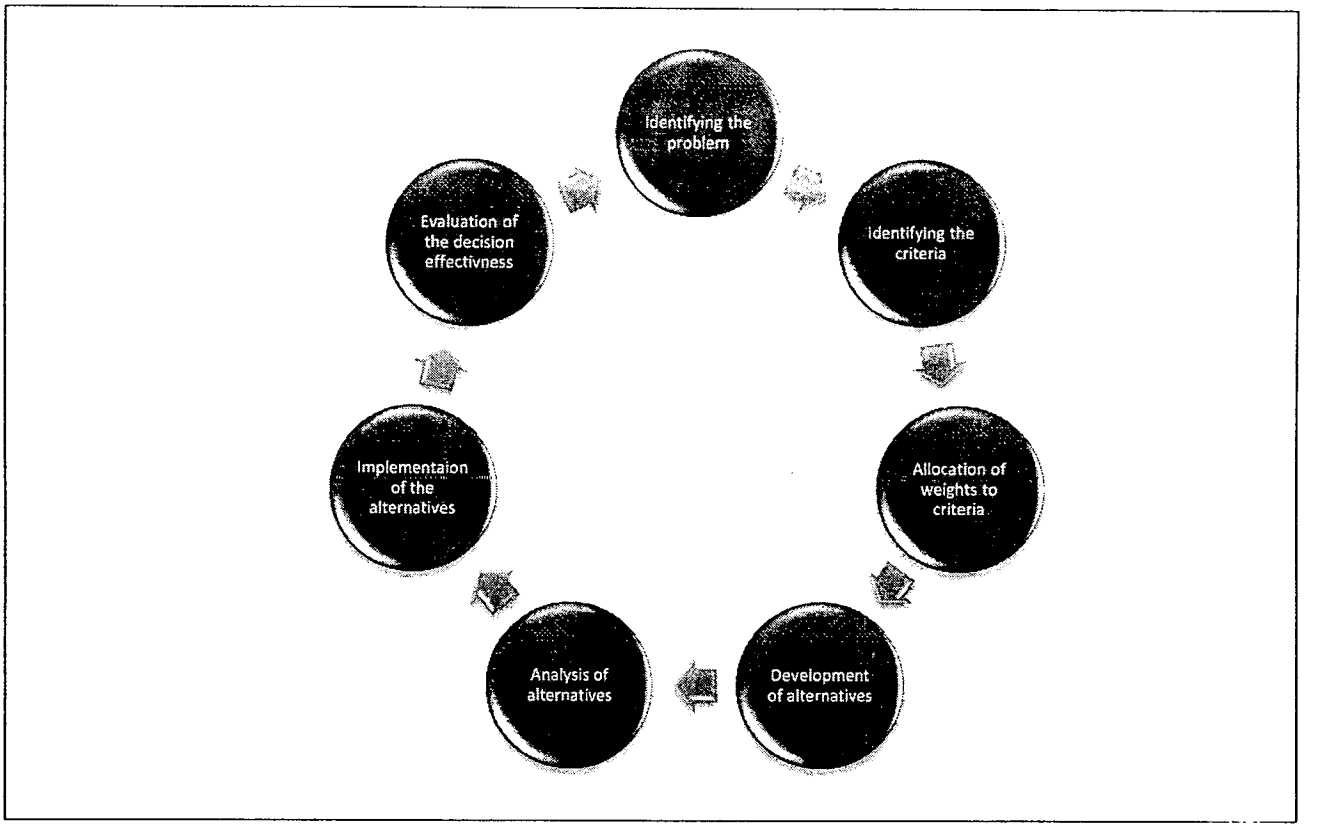

Figure 3: Decision making diagram

Project managers should have the potential to improve the firm's values by enhancing their ability to a quick response to new and unusual business situations as with evolution of risk, an improper communication between the employees could lead to misunderstandings and negatively impact the performance of the firm. In this case, the project manager has to bridge among the diversified branches of project undertaking, but with the proper planning, controlling, and monitoring of all the resources. The goals will then be met and therefore project success achieved.

Risk analysis can play a major role in shaping a project during the design phase and in the planning of the execution. Once the project is under way, project management should involve ongoing attempts to control uncertainty and limit undesirable effects of realized risks.

2.5.3 International project management

Today, teams and organizations face rapid changes like never before. Globalization has increased market opportunities and there are no longer physical obstacles for performing global projects. However these expanded horizons can present new challenges to the global project manager; they can be translated into obstacles that are real threats to conducting good business, yet could be resolved with a combination of new technology and some old tactics.

International projects tend to be subject to the external risk such as unawareness of the social conditions, economic and political scenarios, unknown and new procedural formalities, regulatory framework and governing authority, etc.

While understanding the key differences between cultures, it is essential to establish standards that can meet the work expectations and get everyone on the same page. Managers in this case should be aware of the cultural differences and diverse work methodologies to bridge differences in the most positive manner.

Construction organizations' efficiency and effectiveness largely depend upon how managers scan the external project environment, identify the critical factors and accordingly adapt their organizations (Daniel Baloi, 2002). For that reason, it is important that managers do not waste time with poor communication between the members, and it is not effective to have a human translator in the fields trying to translate to every member what they need. For this reason, the most successful solution is the written communication where individuals with little speaking proficiency can get by with written words, as online translation services can often resolve the language problem and can get any individual point across. (Daniel Baloi, 2002)

2.6 Risk and how it influences the construction fields

In the construction environment, risk could be seen as a choice rather than a fate. According to the British Standard Institution risk is defined as 'the uncertainty

inherent in plans and possibility of something happening that can affect the prospects of achieving, business or project goals' The word ''risk'' was known in the English language in the 17th century. It is believed that the word was originally a Spanish term that meant ''to run into danger or to go against a rock.''

The construction industry perhaps more than others, has been plagued by risk and this has not always been dealt with adequately, often resulting in poor performance with increasing costs and time delays (V.Carr, 2001). Organizations are facing an increasing number and a greater variety of risks, and there is a growing recognition that risk must be managed with the total organization in mind. All organizations are required to have a more practical approach to dealing with risk that goes beyond the statistical and analytical to future scenarios and planning. (Jolly, 2003)

The construction risk industry has recognized the importance of managing all risk especially in the construction firms as it is subject to more risk and uncertainty than many other industries,. The process of taking a project from the initiation to the completion phase requires a multitude of people with different skills and interests, and a coordination of a wide range of interrelated activities. Such complexity opens a door for the risk to play a crucial role in decision making. Risk can manifest itself in numerous ways, varying over time and across activities. Essentially it stems from uncertainty, which in turn is caused by a lack of information (Norman, 1999)

Royer stated that experience has shown that risk management must be of critical concern to project managers as unmanaged or unmitigated risks are one of the primary causes of project failure. Therefore it is important to note that all activities and projects held involve risk, except that this risk varies widely from one activity to another, which is the reason that leads to the possibility of loss or gain, or variation from a desired or planned outcome. (Royer, 2001)

In today's highly complex project environment, there is clearly a need for better understanding of how projects are related to each other and what the implications of

their interrelations are. The companies that understand their risks better than their competitors are in a very powerful position to leverage risk to a competitive advantage.

Risk management is no longer discretionary and it is considered as essential component of the project management. Many companies fail to identify, prioritize and treat risk, which leads them to failure in the whole project;

Risk is inherent and difficult to deal with, and this requires a proper management framework both of theoretical and practical meanings. Risk management is a formal and orderly process of systematically identifying, analyzing, and responding to risks throughout the life-cycle of a project to obtain the optimum degree of risk elimination, mitigation and/or control.

Construction projects are characterized as very complex projects, where uncertainty comes from various sources. Construction projects gather together hundreds of stakeholders, which makes it difficult to study a network as a whole. The point is that future project conditions are hard to predict in the early stages of the project life-cycle; conditions can change during the project life-cycle, and the risk is that they potentially become more severe than was first estimated.

Risks are caused by a lack of certainty and that uncertainty is especially prevalent in the early project phases. Since not all factors can be predicted at the onset of a project, decisions still have to be made, yet there is a risk that the outcome of these decisions is something other then what is expected.

When operating in many different countries with different political, financial and economic systems, it is necessary to note that the impact of the risk varies greatly, as the heterogeneity of the environment in which multinational firms operate has a strong influence on their risk exposure. Therefore we can divide risk into 4 four main categories.

- Pure risk (hazards and weather conditions)
- Financial risk (cash flow or credit risk, exchange rates...)
- Business risk (almost anything that could happen in a project)
- Political risk (politics, legal work, war)

After defining the risk and being able to assess its effects on the whole projects, it is necessary to identify the main points that we have to go through when identifying risk:

Risk Management Structure and Definitions

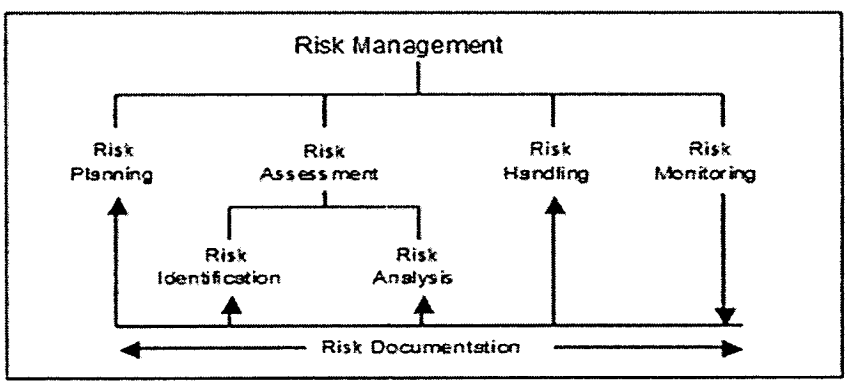

Figure 4 Risk Management Structure and Definition
Source: (risk management, 2003)

1. Risk assessment: construction involves many variables, and it is often difficult to determine causality, dependence and correlations.

   Risk assessment is an important step when protecting project from uncertainty, it is simply examining of what could cause harm to the work and workers and taking necessary precautions.

2. Determination of risk: one can use to main methods to determine the risk using the qualitative and the quantitative method.

   The quantitative approach relies on statistical calculation to determine risk, its probability of occurrence, and its impact on a project. It should be done by a risk specialist using appropriate software tools and software. The probability of costs and time scales can be used to determine the variability of project cost and timescales The qualitative

approach relies on judgments, using criteria to determine the outcome, and it has to be undertaken by the project manager/ team.

3. Risk analysis: after identifying the risk, it is necessary to analyze it by isolating the causes and determining the effects. It includes risk rating and prioritization in which risk events are defined in terms of their probability of occurrence, severity of consequence/impact, and relationship to other risk areas or processes.

4. Risk response : after identifying and analyzing the risk, responding to it plays a major role in the whole process, there are five main points that must be followed when responding to risk
    - Accepting the risk: understanding the risk consequences, probability.
    - Avoiding the risk : will lead to the same effect as low return
    - Monitoring the risk: by choosing some predictive indicators to watch as the project nears the risk point.
    - Transfer the risk: mostly to insurance companies that can take care of all the alternatives
    - Mitigate the risk: covers nearly all the actions the project team can take to overcome risks from the project environment.

The purpose of this process is to ensure that the actions that are planned and taken will have the expected effect on project risks which will increase the organizations' short and long term value to its stakeholders. Risk response planning needs an effective control process by its side to ensure that the risk management processes are iterative and ongoing.

Uncertainty presents both risk and opportunity, with the potential to enhance value; risk management enables management to effectively deal with uncertainty and associated risk and opportunity, enhancing the capability to build value. Value is maximized when management sets the strategy and objectives in order to strike an

optimal balance between growth, return goals and related risk, as well as efficiently and effectively deploys resources in pursuits of the entity's objectives. (Committee of Sponsoring Organizations of the Treadway Commision., 2010)

2.7 Risk Exposure

Companies that understand risk better than their competitors are in a very powerful position to leverage risk to a competitive advantage. Greater risks knowledge delivers the ability to deal with risk that intimidates competitors, to project adversity better than competitors and to manage risk at the lowest cost (Davemport W. Edgar & Bradley L.Michelle, 2010). For that reason, it is worth noting that there are many factors that can expose project to higher than normal risk that we should know about:

- Team size: the larger the team, the higher the probability of a problem arising. For example, communications can be more difficult as the number of participants increases. The number of interactions among people increases and thus they require greater coordination.
- History: newer projects are riskier because the processes have not been refined. The more time a project of a similar nature has taken to be done, the greater the likelihood of success.
- Complexity: the more sophisticated a project is, the greater the opportunity of making a mistake or causing a problem.
- Time compression: if a schedule is highly compressed, then the risks are magnified. Having more time means greater flexibility and wider opportunity to prevent or mitigate the impact of errors.
- Staff expertise and experience: if the staff lacks direct experience and knowledge of the subject, people will struggle to learn as they go along, robbing the project of time and possibly introducing errors.
- Resource availability: the more the resources are, the greater the ability to respond to problems. For example, more money brings greater ability to secure

equipment or people when needed. Plentiful resources, of course, do not guarantee protection against risk; however it does provide the means to respond to it.

- Management stability: management stability implies unity of direction, which in turn means reaching goals. Management irritability can lead to unrealistic scheduling and inefficient use of resources.

2.8 Types of risk

New risks emerge with the changing business environment. Advances in technology, globalization and increasing financial sophistication contribute to the growing number and complexity of risk, even the insignificant risks when they interact with other events and conditions that can cause great damage.

Financial risk to contractors includes whether the owner of the building has enough money to complete the project or not. It also includes the financial failure of the owner of the building or subcontractors, the availability of money to the contractor in a suitable manner and time to enable the contractor to progress with the work, etc. Financial risk influences the cash flow of construction contractors; it is hardly surprising therefore that this source of risk is highly important for them. (Jaafari, 2006)

Construction risks, or job site related risks such as the availability and productivity of labor, soil and site conditions, material shortages and quality, site safety, etc, are important to the contractors unlike the project management practices because these risks are related to the construction process on site. (Jaafari, 2006)

Risks can be viewed as business, technical, or operational. A technical risk is the inability to build the product that will satisfy requirements. An operational risk is the inability of the customer to work with core team members.

They can be either acceptable or unacceptable. An acceptable risk is one that negatively affects a task on the non-critical path. An unacceptable risk is one that negatively affects the critical path.

Risks are also short or long term: a short-term risk has an immediate impact, such as changing the requirements for a deliverable. While a long-term risk has an impact sometimes in the distant future, such as releasing a product without adequate testing.

Risks are also viewed as either manageable or unmanageable: a manageable risk is one can live with, such as a minor requirement for change, while an unmanageable risk is impossible to accommodate, such as a huge turnover of core team members. Risks are either internal or external.

2.9 Limitation of risk management

If risks are not properly assessed and prioritized, time can be wasted in dealing with risk of losses that are not likely to happen. Spending too much time assessing and managing unlikely risks can divert resources that could be used more profitably. Prioritizing the risk management processes too highly could keep and organization from completing a project or even getting started. This is especially true if other work is suspended until the risk management process is considered complete.

"Contracting overseas construction projects is usually considered as a 'high risk business', mostly because of a lack of adequate overseas environmental information and overseas construction experience. Similar construction projects may have totally different risk characteristics in different regions. It is difficult for a newcomer to identify new risks in a new environment. It is more difficult to assess these risks and the subtle impact of relationships among them." (He Zhi, 1995)

2.10 Sources of risk in the construction field

The common sources of risk in construction projects are listed below:

- Misunderstanding of contract terms and conditions.
- Design changes and errors
- Poorly coordinated work
- Poor estimates
- Poorly defined roles and responsibilities
- Unskilled staff
- Natural hazards
- Political and legal problems

Risk is inherent and difficult to deal with and this requires a proper management framework both of theoretical and pratical meaning, however the typology of the risk seems to depend mainly upon whether the project is local or international, the internal risk are relevant to all project irrespective of whether they are local or international (A.DEVIPRASADH, 2007)

2.11 The link between operations and risk management

Risk management should be a fully integrated part of planning and executing of any operation, routinely applied by management.

In the construction industry, with the high probability and severity of accidents or loss from exposure to various hazards, it is important to identify risks and benefits and to determine the best courses of action for any given situation. Operations managers are the ones responsible for the routine use of risk management at every level of activity, starting with the planning of the project until its completion.

2.12 The link between projects and risk management

In recent days, one can easily notice the intensive research and development that has been done in the area of project risk management. When dealing with a risk management has to always take into consideration the improvement as there is no opportunity without a related risk.

According to Mills A, in his book, A systematic approach to risk management for construction, Structural Survey, 2001, the project management process in a wider sense should not solely be to ensure a successful project completion but also to increase the expectations of project goals and objectives (Project Networks and Managing Risks in Project Networks, 2006)

Risk is not always related to the event but it is more related to the future project conditions that are hard to predict in the early stages of the project life-cycle, therefore it is always important to take into consideration the degree of impact of the risk on the entire project.

Some authors replace the term risk by uncertainty. Chapman and Ward - who explained that the uncertainty which matters is critical to all projects and that this uncertainty relates to more than just time and cost objectives of a project~~, but~~ – state clearly that it also includes which parties ought to be involved, their motivation and their corporate strategy. According to these authors, managing theses uncertainties efficiently is a best practice in risk management

Many project managers, however, skip the risk management process because the sponsor wants them to start executing the project quickly. Nevertheless, the process of risk management does not aim to remove all risks from a project completely; its objective is to develop an organized framework to assist decision makers to manage risks, especially the critical ones, effectively and efficiently.

The types of exposure to risk that an organization is faced with, are wide-ranging and vary from one organization to another. These exposures could be the risk of business failure, the risk of project financial losses, the occurrences of major construction accidents, default of business associates, disputes, and organization risks. It is desirable to understand and identify the risks as early as possible, so that a suitable strategy can be implemented to retain particular risks or to transfer them to minimize any likely negative aspect they may have.

Many challenges face the project managers and the project team and the top ten challenges that the project team can encounter can be summarized in the following:

- Unrealistic Deadlines
- Communication Deficit
- Scope Changes
- Resources Competition
- Insufficient team skills
- Lack of Accountability
- Uncertain Dependencies
- Customers and end-users that are not engaged during project
- Failure to manage risks
- Vision and Goals not well defined throughout project process

It is important to note that the riskier the activity, the harsher the consequences in case of wrong decision. Businesses would like to quantify risks for many reasons: knowing how much risk is involved would help decide if costly measures to reduce the level of risk are justifiable. It can also help to decide if sharing the risk with an insurance company is justified. Some risks, such as natural disasters, are virtually unavoidable and affect many people. All choices in life involve risk. Risks cannot be totally avoided, but the choice can be made so that risk is minimized.

2.13 How important is the link between operation and project management

In order to be able to assess the link between operations and project management and how essential it is, one has to understand how every party and organizations, with their coordination and cooperation interrelate to form an integrated whole project. The Ministry of Man Power and The Ministry of National Development of Singapore note that one of the primary reasons for low productivity in the construction industry is the lack of integration of activities across the project life cycle.

It is noticeable that collaboration has been talked about in business circles for years but few strategies have been put forth to accomplish it effectively. However in a complex , global environment, and with new technology, collaboration is becoming a central part of the work.

Law and Ngai demonstrated that knowledge sharing and learning behavior would contribute to better performance and business process improvement to the product and series offered by a construction firm (Ribeiro, 2008)

In any organization, only two aspects of work exist: the on-going operations and projects. Projects are defined as unique, temporary events with a specific beginning and end. Operations constitute an organization's on-going, repetitive activities, such as accounting or production. Since all work and/or efforts performed within an organization are characterized as either operations or projects, all of the costs of an organization must be distributed to either operations or projects. However, the value of the link between operations and risk management, and the share of information relate directly to how effectively the managed knowledge and expertise enable the firm's employees to deal with today's business situation and effectively envision and create their future.

Clearly, the key difference between the two roles in a company is the time frame of tasks. The successful outcome of many projects relies on quality services from operations including safety, training, facilities and business processes. Both areas –

projects and operations – must be professionally managed to ensure effective organizational performance.

What is essential in this study is to understand how project management and operations should structure themselves and operate in ways that allow their objectives to be met by aligning targets across the organization. Every department should be working towards a common goal. Thus to be able to achieve this goal, it is necessary to take a look about the differences between these two departments and how they should be linked together.

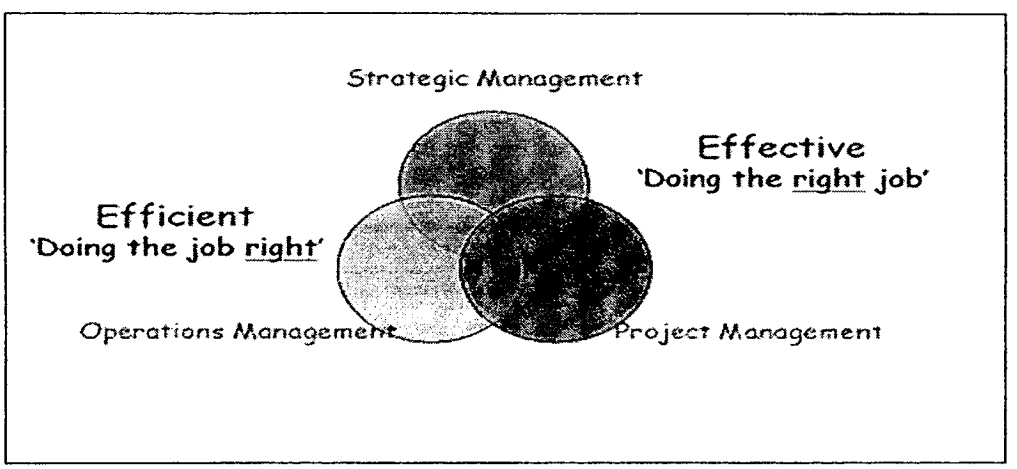

Figure 5 Strategic Management
Source: (Nigel Slack S. C., 2010)

Operational works are done to achieve business goals, whereas projects are executed to start new business objectives. Operations and projects have few intersection points during the project life cycle that could make them face more uncertainty thereby a higher risk. Project management is used to manage projects whereas business process or operations management is used to execute operations.

2.13.1 Difference between projects management and operations management:

One can appreciate the fundamental difference between project work and operational work by listing down their differences and similarities.

Projects management	**Operations management**
Temporary	Ongoing
Unique	Repetitive
Attain its objective and then terminate	Sustain the business
Effective	Efficient
Goals	Roles
Risk uncertainty	Experience
Transient resources	Stable resources

Table 1: Difference between project and operation management
Source: (Turner, 1999)

These tables summarize the difference between the project management and the operation management and the specific characteristic of the uniqueness for the project manager

2.13.2 Similarities between Projects and Operation

Despite the differences between the operations and project management, we can still find the importance similarities of each job for the organization

- Performed by people
- Constrained by limited resources
- Planned, executed, and controlled

2.14 Why companies engage in international business?

Overseas investment of multinational firms is not only a huge opportunity but also an enormous risk. To assess and manage this risk multinational firms have to understand the volatility of the global marketplace. This puts pressure on local cultures and on traditional market arrangement. (Boczko, February 2005) Organizations today must respond rapidly to customer needs and rigorous global competition as most of the international business compromises a large and growing portion of the world's total business.

International projects tend to be subject to the external risk such as unawareness of the social conditions, economic and political scenarios, unknown and new procedural formalities, regulatory framework and governing authority, etc.

International business entails private as well as governmental transactions across country borders. International businesses operate in an environment shaped by the government, competitors, consumers, suppliers, and international factors. It is within this business environment that organizations function and have to determine strategies and a modus operandi that allow them to meet their organizational purposes in ways that comply with the relevant legal and regulatory frameworks.

When operating internationally, a company should consider its mission , what it will seek to do and become over the long term , its objectives - specific performance targets to fulfill its mission , and its strategy the means to fulfill its objectives. (John D. Daniels L. H., 2004).

Eventually, many reasons lay beside international business expansion; first its sales will expand as the purchasing power of the people are higher for the world as a whole than for a single country, second many companies are mainly searching to acquire resources so they will improve their product quality and differentiate it from their competitors.

Companies are responding rapidly to many foreign opportunities, they can shift production quickly among countries due the fast expand of technology and also because they can transport the goods more easily. Nowadays with the liberalization of government policies on cross-border movement of trade and resources, and with the development of institutions that support and facilitate international trade, more and more companies get involved in the international business and operations.

2.15 External influence of the international business

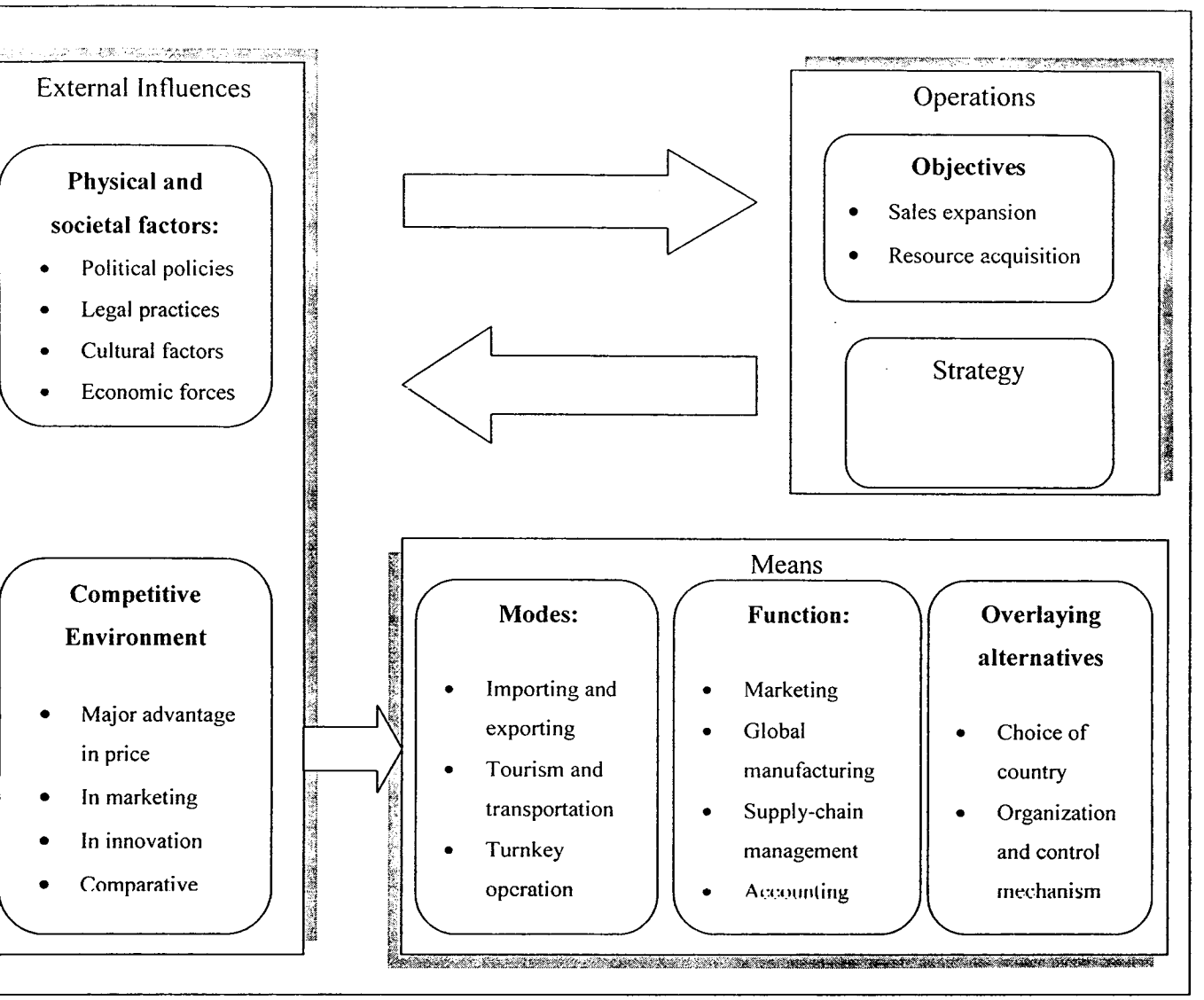

Figure 6 Eternal Influence of the international business
Source: (Walewski, 2003)

Any company should examine the external environment before deciding to implement any project or strategy, as companies' faces different external environments in each country where it operates.

When operating internationally, the managers should have in addition to the knowledge of business operations, a working knowledge of basic social sciences and what the new environment is made of to help their project design competitive aspects. (John D. Daniels L. H., 2004).

Once these managers understand the societal values, attitudes and beliefs, it will helps them function better in different countries as the external environment may affect each function of the company. The most important aspect that remains is politics, as it helps to shape business worldwide because of political leaders how international business should take place.

One of the aspects we have to be careful about is the pricing sensitivity, however to effectively implement pricing strategy; marketers must understand price elasticity of their product over different levels of output (Howard Formana, 2005)

The pricing managers should than scan the environment to ensure they are establishing prices that are competitively advantageous.

Barrier to entry can play a significant role in developing pricing strategy and include nontariff trade barriers, patents, or technological advantages. Firms in industries where these barriers to entry are high, tend to be in a better position to retain relatively high prices and profits without fear of competition. (Naumann, 1991)

2.16 Executing the project plan

When executing the project plan, it is important to start with an understanding of the overall objectives of an enterprise and what strategy they will use to achieve those objectives. It is necessary to know that this step includes external, internal and risk management contexts; where it's important to define the relationship of an enterprise with its environment, including the enterprise's strengths, weaknesses, opportunities, and threats (SWOT analysis) , and the most important thing is to identify the communication policies with the stakeholders.

Project management includes developing a project plan, which includes defining and confirming the project goals and objectives, identifying tasks and how goals will be achieved, quantifying the resources needed, and determining budgets and timelines for completion.

It also includes organizing the implementation of the project plan, along with operating regular 'controls' to ensure that everything is accurate and that all the objective information on 'performance' are relative to the plan, projects usually follow major phases or stages, including feasibility, definition, project planning, implementation, evaluation and support/maintenance.

The key of any successful project is planning, and many steps should be followed to reach our target:

- Project goals: it is important to identify the stakeholders in your project, and when all their needs are met the project can be set as successful. Once the need of the stakeholders are understood we have to create a set of goals that should be measured to be able to know when the need and expectation of the stakeholders are met.

- Project schedule and delivery: after all the needs and expectations are met, comes the task of specifying how and when each item must be delivered. To be able to understand better this step, two points needs to be identified; first the amount of effort required completing the task, second the resource of who will carry out it. (Once those two points have been established, accurate delivery dates, software can be use to help in this specific task).

- Supporting plan: the supporting plans are plans that should be a part of the planning process such as the human resources plan to be able to identify the individuals and describe their roles and responsibilities.

This step involves documenting the conditions and events that represent material threats to an enterprise's achievement of its objectives, a communication plan must be set by creating documents showing what the information we need is and how they will be provided and received. Daily, weekly, monthly reports should be sent, depending on the tasks, so all the staff will be able to know how the project is performing and achieved and if it is going as planned.

After implementing all the necessary for the project to be read, we need to evaluate the key of success of the project. Below are the key elements:

- The scope: Requirements are needed in detail in every project and every member of the team should fully understand these requirements.
- The plan : Indicate who is responsible for each task and who manages the delays in the schedules given preciously
- The risks: Anticipating potential risks before they occur, to be able to prevent them from happening, or manage them better. It is a common mistake to just hope the risks will not actually occur and therefore not plan for them.
- The dependencies: The number of work that needs to be completed by one individual or the whole team before another piece of work can be started. In that phase we need to understand why every task is critical to another.
- Budget: Cost can and probably will change during the path of a project, in most of the cases an increase of the cost will take place and it is necessary to explain it to the customers.
- Time and product delivery: the ability to deliver on time, being punctual and accurate when it comes to the delivery time and schedule is very important when signing the contract

2.17 Conclusion

Construction projects are sometimes prone to failures as of bad initiatives in technology, poor decisions in environmental management plans, and wrong implementation methods. The cause of failure could be classified as business risk (external risk) and operational risk (internal risk), and unless they are addressed in the early project stages, the project will fail to achieve its objectives. (Triangle, 2010).

Effective risk management involves the entire project team; and in order to reduce uncertainty, operation managers in addition to the project managers, should be familiar with the challenges they are going to face, the most important aspect of the project is to grasp the main constraints outlined in the project management and strike a balance between them in order to maintain the quality of work.

Operations and project management departments should lead the operative teams in their proper tasks and work toward the same goal in order to achieve expected results. They should always carry out their roles in a very effective manner, meeting deadlines, satisfying the customer within the demanded budget; however the essential matter is to decide which method will be ultimately carried out as in such situations risk is inevitable. Still managers have to ensure that risks are kept to minimal level.

The researcher in his study will define how managers can plan their strategies to reduce the impact of risk as it is not easy to totally eliminate it, and how the entire project team should be aware of it in order the implement the most successful methodologies and techniques therefore staying within the defined statement.

In summary, the findings about the construction fields are impressive and the methods of treating are delicate, as many processes should be assessed, controlled and monitored and at the same time the information must circulate in a frequent basis, where every change in the company must be sent to all the main parties.

Cooperation and coordination between the parties felt to be a serious situation as all the lack of data and information circulation is making failure more easily.

We began this chapter with a discussion about the construction, operations, project managers and risk assessment by relying on secondary data as well as a primary one, Clearly, the key difference between the two roles in a company is the time frame of tasks, however both departments work towards many common goals like planning, execution, monitoring and control as well as the constraints by the limited resources.

In the coming chapters, meetings are going to be conducted with contractors, architects and developers in order to draw a clear idea about the construction fields and how departments should be linked together to keep the resources and information running .

The researcher will stress on how important it is for an organization to implement and understand the vast body of knowledge related to risk management, so that the company could make intelligent decision about how to reduce the risk based on a clear documentation, between the departments that can be translated in the context of a software directed by executive management, used by all the parties in the companies, and which grant access to data in accordance to the role of every employee in the organization.

Chapter 3

RESEARCH METHODOLOGY

3.1 Introduction

In the previous chapter, we elaborated on the definitions of each component and the method for minimizing the construction management risk equation: (Operation management+ Project management = Lower construction management risk). Thus, the relation between the variables has been explained with references to relevant literature on the topic.

However, we consider that it is not sufficient to refer to secondary data as they are unable to provide reliable results. Therefore, the researcher has chosen variables to be tested and validated at the end of the investigation. In this chapter, the researcher explains the methodology followed to conduct the research by explaining the tools and means used to achieve the conclusion.

3.2 Research Question and Hypothesis

Choosing the research questions is the main element of both quantitative and qualitative research and it helps constructing the conceptual framework of the study. The questions should cover the needed areas for further exploration and whether the community is interested in the projector not. Research questions are used to verify the significance of the study to the field; therefore the questions asked should cover specific areas that need further exploration

In order to choose the most appropriate question to the study, the researcher has formulated alternative questions on operations and project management in their direct association with the creation of construction management risk. Hence, the research question is the following:

"Unless good procedures are taken to link the misleading information between project and operation management, firm will always be threaten by high risk."

As the research question is broad and cannot be verified easily, the researcher chose to divide it in sub-questions which are known as the hypotheses of the research:

Thus the hypothesis chosen for this research, which are directly linked to the research question, are the following:

H1: investing in project management and operation management will reduce the intensity of risk impact.

H2: Linking operations and projects managements to meet the same goal will play a role in reducing the risks

To be able to give a clear subject study, the two hypotheses were divided into several subjects and each subject was defined and studied alone.

3.3 Selected Variables

Hypotheses serve two objectives. First, they prove the nature of the relation between two variables (the dependent and the independent). Second, they prove the implication of the hypothesis to the real case scenario which makes it more important to the study. More to the point when the variables are studied and analyzed (statistically in this research) the aim of the research would then be either proven to be correct or incorrect and whether the hypothesis is positive or negative.

3.3.1 The dependent variable

For instance, in this investigation on the impact that operations management and project management have on the construction management risk; the researcher chose the construction management risk to be the dependent variable for both hypotheses since it is affected by the other two variables chosen and its movement is highly dependable on the other two.

As it was shown in the previous chapter that construction risk management is an essential step in the construction fields. Project managers and operation managers both work towards one goal, which is minimizing the risk, by controlling, monitoring and implementing different processes and tactics which will lead to the success of projects with the minimum risk possible, therefore

proving the significance of choosing the "*Construction Management Risk*" as the *dependent variable.*

3.3.2 The Independents Variables

For the independent variables, the researcher chose two separate variables. The first *independent variable* is *operation management.* While the second variable is considered to be *project management.*

As for the nature of the dependent and independent variables chosen for this research they are all qualitative and aim to prove the degree of correlation between operation management, project management and construction risk.

3.4 Methodology Used

The main aim of the methodology applied is to test the above mentioned hypothesis. For this purpose, the researcher refers to several types of data and sources available which will be better explained further in this chapter, to make a more solid ground for the study the researcher refers to other sources of data else than the previously published; thus an independent examination is conducted and analyzed statistically.

3.4.1 Data Used

The research methodology will describe in this chapter the usefulness of appropriate documentation, communication tools and software devices/technology; and point out how the link between operations and project management enhance the ability of better control and monitoring. This chapter will include a questionnaire, the sample size, the population and the instruments used to collect the data.

The system of collecting data for project research is known as the research methodology and the need of such research is to acquire new knowledge from the market and be able to define what the impact that will be revealed is when we combine the coordination of two departments.

The data was collected using a scientific technique that consists on observations and interviews which are able to help companies better spot their strengths and weakness in order to benefit from opportunities and avoid threats.

The researcher has used several types of data to get to the final results, a survey questionnaire conducted with different contractors from different sizes companies via emails or personnel meeting, also qualitative data was analyzed.

3.5 Research approach

In most of the research conducted we use two kinds of approaches: the inductive and deductive approach

The deductive reasoning works from the more general to the more specific, sometimes this is informally called a "top-down" approach.

This approach starts with the general theory and ends with the specific, where a certain hypothesis is formed and tested in order to support the general ideas.

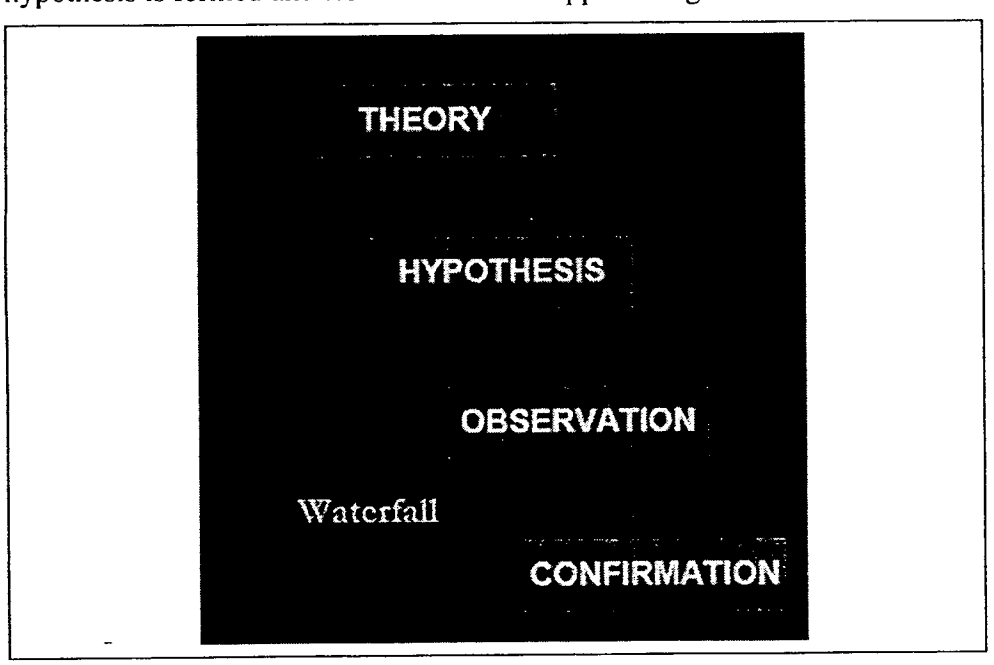

Figure 7 Deductive Approach
Source: http://www.drburnez.net

While inductive reasoning works the other way, moving from specific observations to broader generalization and theories. It is called informally "bottom-up" approach.

In inductive reasoning, researchers start with specific observations and measures, begin to detect patterns and regularities, formulate some tentative hypothesis that can be explored, and finally end up developing some general conclusion or theories.

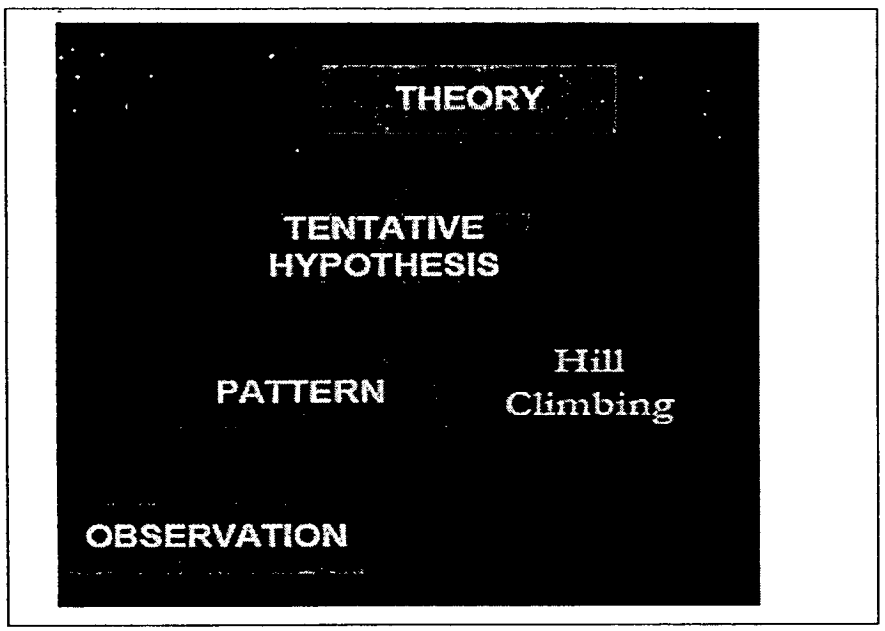

Figure 8 Inductive approach
Source: http // www.drburney.net

The hypothesis of this study begins with the theory and ends up with the confirmation of the result found, so in this case we are using the deductive approach, the hypothesis will be tested and analyzed to confirm whether it is feasible or not.

3.6 Data Collection and methodology used

In this study we used the primary data by collecting and using direct observations from many surveys, and questionnaires deducted from contractors, architects, developers, project and operation managers, who work in several companies which deal with the construction fields internationally, especially Sayfco holding enterprises. The researcher has also used the secondary

data that is collected from external sources such as internet websites, journals, research articles, books, review and other.

3.7 Research strategy

A total of 60 contractors and architects, from different companies within Lebanon were selected to make up the sample. The selected participants were invited to answer a structured questionnaire with predetermined and standardized questions in order to obtain consistent information.

In order to reduce bias and code error and obtain consistent information which are commonly used in any market research, predetermined and standardized questions are answered within the context of a structure questionnaire.

All the data gathered from this research instrument were computed for interpretation and analyses; in addition to primary data gathered from mainly secondary resources in published articles and literatures in order to support and stress on the survey results to support the survey results.

A Likert scale from 1 to 5 was used in the questionnaire and the responded were supposed to judge the significance or expected loss of the each project. A Likert scale measures the extent to which a person agrees or disagrees with the question, it's a psychometric response scale often used in questionnaires.

The researcher used two attributes in his study the probability level of the risk occurrence, and the degree of impact if the risk occurrence.

By applying this approach, the respondents were required to judge the probability level of risk occurrence by selecting one from among five levels: " Very small, Small, Normal, Large and Very large". And also were required to judge the degree, while the researcher concluded the judgment about the degree of impact after they have conducted the interview.

3.7.1 Collection of primary data

The primary data has been used in this thesis in order to increase the understanding of the questions that came up in this work. The questionnaire shown in appendix 1, was sent to a number of people in Sayfco Holding, and many other companies that deal with international construction and construction consultancy, which were able to provide us with relevant information for the study.

Primary source of data provides first-hand information to the researcher. It is original, collected for a specific purpose and it is used to solve a specific problem, and what makes it interesting is that it can allow the researcher to have a higher control level over how the information is collected, to which extent it is accurate and if it could be used in the research for clear results.

The questionnaire was designed to find out reliable information on the risks affecting the company and consequently their impact.

The questionnaire was divided into 2 sections; the first questionnaire was mostly used in the interviews where information about the international projects conducted by the company was collected, with additional information on how communication and documentation are implemented within the company, so that its effectiveness could be assessed.

The other section was mainly a rank from 1 to 5 about the variables that affected the risk in the company and to which extent it will affect the company.

3.7.2 The secondary data

Secondary data started by gathering many articles that studied the risk management, the project management and the operation management, also some books were read about the art of the construction and how the project is held and implemented and how the control inside the company must be spread between the departments and personnel.

Many advantages lay down with the secondary data, it will save time and cost. We have to note as well that the data that is conducted from books and journals, as accurate reference, are with

high quality and offer the researcher more info to be able to do the analysis and interpretation. The only problem that we face here is that some data are outdated, and complex.

3.8 Conclusion

In this chapter, we have presented a detailed description of the research strategy and methodology according to which the researcher conducted the study and thereby chosen all the data revolved around both operation and project management leading to a clear risk assessment.

Primary and secondary data where used to justify the hypotheses yet to determine to what extent the objectives will be achieved, and how each person in the organization must be responsible for managing aspect of risk management implementation.

In the coming chapter, the researcher is going to give an idea about the selected company and the challenges that it might encounter, and that by stressing on the issues that were noticed during the development of the research and the conduct of the interviews.

Chapter 4

CASE STUDY: SAYFCO HOLDINGS S.A.L.

4.1 Overview of Sayfco holdings

For the purpose of this dissertation, the researcher took Sayfco Holdings S.A.L as an example to verify first on how the link between the departments does affect the relation and the success of the project, by focusing on the management system of Sayfco that plays a major role in achieving and accomplishing projects on time, respecting thus the highest standards of quality while honoring budget limits.

As shown in previous chapter, the construction industry is overwhelmed with risk and if the management doesn't tackle this issue with utmost care, the industry will consequently suffer of poor performance.

Sayfco has a wide range portfolio with several activities dealing in many sectors such as infrastructure, hospitality, education, residential and commercial.

Since 1978, the company has been known for its expertise and its reputation of delivering the most successful projects to a broad base of clients from the public and private sectors.

Through its commitment to corporate values Sayfco has managed to assess its opportunities. It has often stressed on decision-making by evaluating calculated risks, and has maintained confidence along the years especially on work ethics. Clearly its aim is to maintain confidence. The quality management system plays a key role in the company in delivering absolute customer satisfaction.

SAYFCO HOLDINGS S.A.L, is a private Lebanese company wholly owned by the Yérévanian family, with its headquarters in Lebanon. The initial company name was 'Ara Yérévanian Establishment' and was founded in the early 1960s by the late Ara Yérévanian, former Member of the Lebanese Parliament.

In 1995, the company's name was changed to 'SAYFCO-Ara Yérévanian and Sons' and in 2004 to SAYFCO HOLDINGS, when all subsidiaries were merged. The group's current Chairman-President-C.E.O is Mr. Chahe Yerevanian.

With a 50 year track record in the real estate industry, during which it has successfully completed over $1 billion worth of projects representing over 2 million square meters of real estate, the company specializes in the development of large scale residential and commercial centers. Initially focused on the development of middle-income housing, the company rapidly extended its scope to include the development of large luxurious residential and tourist developments.

With a client base spanning several regions around the world, SAYFCO has earned worldwide recognition for excellence in the real estate development industry. In the past 2 years only, the Company has added over 400 satisfied clients from the countries of the GCC.

Since its initial inception, SAYFCO has grown into a multi-faceted private company, offering all aspects of contracting services, from the undertaking of feasibility studies, to financial analysis, design, building, promoting, and managing luxurious apartments and commercial centers; in addition it offers in-house residential and commercial mortgage financing for up to 20 years to qualified customers.

SAYFCO delivers premium quality, combining aesthetically-leasing finishes with functional reliability and demonstrable dependability; they mainly emphasis on quality control, attention to detail and artistic execution of complex tasks. Along time these commitments have increased the company's reputation.

To ensure a greater success in its projects, the company focuses on 6 key elements:

- Clients: Provide them with the highest quality and value in order to maintain their esteem and loyalty

- Management: To foster creativity by giving every individual the freedom of action in attaining the corporate objectives
- Human Resources: To ensure a pleasant and safe work environment for the wellbeing of all employees; to recognize individual achievements and value diversity.
- Growth: Provide premium quality and performance, to satisfy the clients' real need and therefore produce innovative projects that allow growth.
- Fields of interest: To participate in fields of interest that enhances the construction expertise while offering opportunities for future growth.
- Citizenship: To honor civic duties and social obligations in the nation's key economic, intellectual and social areas.

The executive management group of the company is the operating committee. It sets up the strategy and direction of the firm; it also ensures effective coordination and decision making across the organization. The role of the committee includes:

- Developing group strategy
- Challenging and approving strategic business plan
- Reviewing operating performance of the corporate functions and agreeing on corrective actions
- Motivating and rewarding working teams while training them on best practices.

The corporate office manages numerous projects; it proceeds with different tasks and informs units about shared services which allow the company to obtain the best practices from its operations. Knowledge sharing and investment planning are the company's major assets.

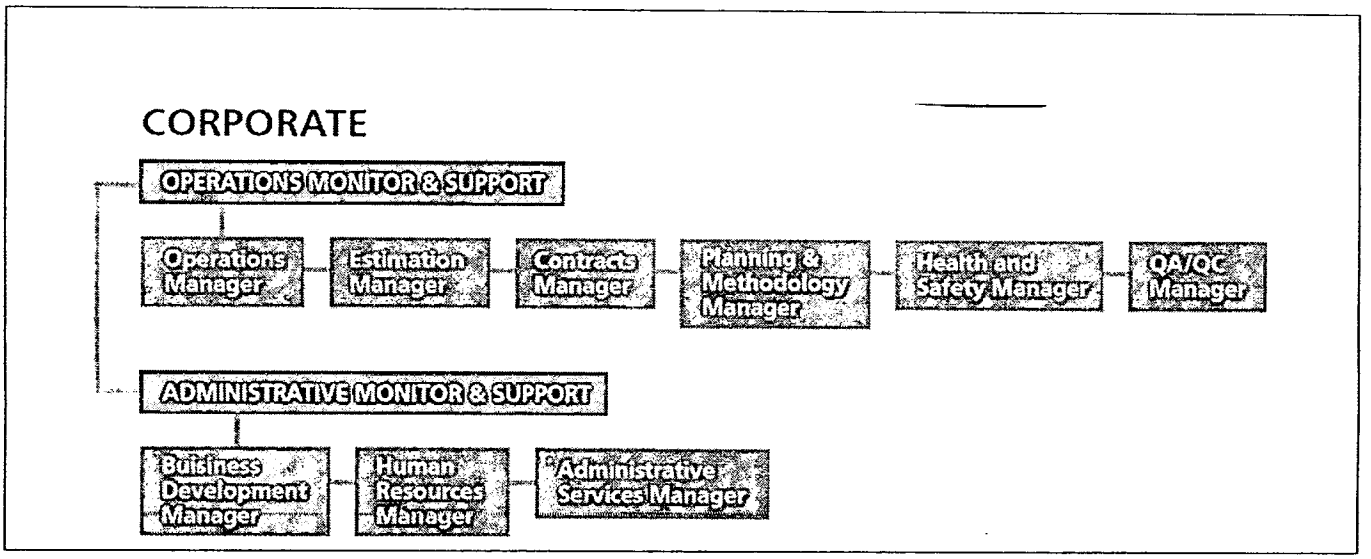

Figure 9: Corporate Chart of Sayfco Holdings S.A.L
(Source: Internal source from the company)

4.2 Ethical issues

The main importance of any social research is to be conducted in the most ethical manners, it is important that the researcher conducts a voluntary participation, as we will guarantee confidentiality, and all the collected data and information will not be revealed to anyone who isn't directly involved in the study.

In our research, the main idea was to concentrate on how important the documentation and communication between the project department and the operation department are, and that in order to ensure a better quality projects, how minimal variables do affect the growing of a risk and the impact of the company, and how the control and implementation help reduce the risk and transform it to a useful situation.

4.3 Conclusion

This chapter has presented an overview of the approach we are going to use, and we will explain in the next chapter the methodologies including software and programs that the company should work on in order to have accurate data.

Despite the fact that Sayfco Holdings has proved over the years the strength to survive in the Lebanese market and especially after July 2006, and despite the fact that it has recognized the importance of a risk management process where it is needed to identify, assess, control and monitor risks arising from their business activities; yet the company is always compelled to improve its overall performance and seek higher standards. The truth is that SAYFCO is never satisfied with the current market situation and strives to increase the implementation of its risk assessment methods.

We believe that in order to reduce the company risk, the market should be studied carefully, and this research aims is to study the internal and external factors of Sayfco. Such aim will allow the researcher to increase market opportunities and company strength while decreasing market threats and company weakness.

Globalization has increased trade relations between nations which resulted in higher competition on all levels of local and international markets; thus companies like Sayfco have to take into consideration local and foreign competitors.

One of the major issues that the researcher believes in, is that Sayfco should implement a management information system. The primary aim of this procedure is to minimize the company's exposure to unforeseen events and to provide certainty for the management of identified risks in order to create a stable environment. The implementation of such system will enable Sayfco management to organize more efficiently its workforce, projects, while keeping an eye on operational and strategic risks.

Another initiative that Sayfco should take into consideration is an organizational chart where the higher management unit of the firm should study department vacancies. Then accordingly

Sayfco should employ people with specific job descriptions that detail all tasks and assignments, including duties for acting as intermediates between the field and office management, and other decisive plant/site function.

The first hypothesis were assumed in order to study how the control and communication between parties can lead to risk and cost minimization, and the second hypothesis stated that there is a significant positive relation between the coordination in the company and the reduction of the risk.

Chapter 5

FINDINGS

5.1 Introduction

When risks are unidentified they could seriously threaten operation management and undermine the natural evolution of procedures. In some cases they can even paralyze the transition between crucial phases of construction. For this reason, and prior to all forms of executions and structured plans, operation managers should double-check all factors that constitute the body of a project. They should also inspect in close association with department team, the central elements that could be affected, one way or another, by risk.

Pre-planning in the post-industrial age of our globalized world is necessary. Indeed, the operational mindset of the 21st century is different than the one from 20 or 30 years ago. International norms and standards have changed considerably. The nature of risks has evolved too, most particularly within regional or international contexts, and often in transnational ventures.

On the other hand our findings reveal some key aspects that have influential in the course of events. Thus, factors of competency, commitment and skill could affect both positively and negatively projects of construction. A shortage of appropriate skills or negligence could accelerate the development of risks and even derail initial plans. Meanwhile higher degree of involvement in all details of construction could lower the emergence of risks.

Risks, regardless of their nature and intensity, could trigger an unpredictable chain of events whose consequences could be hard to overcome. Before launching our survey we proceeded on the reexamination of the literature review. Thus most of the authors we have cited underline the necessity to establish open lines of communication and favor on-hands approach to lessen the probability of risks.

In this context, management practices like collaboration and cooperation become primary tools which enable operation teams and units to properly address the various types of risks. Furthermore, these tools are associated with important instruments like documentation and software. When they are exploited with diligence risk-related issues will be solved. Our findings offer detailed analysis of these risks, accompanied with figures and numbers of our questionnaire results.

Thus, in this chapter, we will analyze the data collected from several firms in order to define and evaluate the relationship between many variables that could be taken into consideration in the project management.

For a better understanding of this process, we have divided the survey analysis in five broad: "Documentation risk, financial risk, market risk, technical risk, and other risks." We have also decided to analyze each of these risks separately to offer a clear picture regarding the nature of risk impact that the companies are confronted with.

5.2 Documentation risks

The functions of operation managers are defined at length in a recent study titled ''Understanding Operation Management". A closer examination of this study reveals that operation managers have the tasks of managing effectively ''manufacturing'' and ''service'' operations. They are also solicited to supervise various assignments and ensure the transition between various cycles of the project. In most situations they have to direct responsibilities and manage a long process that embraces design, planning control and operation strategies.

Furthermore, operation managers should be well documented about the prospect and scope of their projects because risk is a factor that is always highlighted. Therefore they use software devices and check updated reports to monitor all types of risks in the construction fields. Eventually all the information must be transmitted to concerned parties, especially details about the project sequences.

In the literature review, we notice that Bennett does often highlight the importance of managing resources with care, while coordinating the right documentation and keeping good communication activities to track the whole project.

From the survey we conducted, figure 10 indicates that 22 % of the respondents believe that the usage of documentation helps them assess the risks in construction fields. Moreover, among the total population more than the average thinks that it may have large impact on evaluating the risk. So the accuracy of reports has in itself a decisive role when it comes to communicating between the departments, where the correlation between these two variables tend to be strongly positive; therefore when reports are accurate, chances of detecting risks could increase. Thus communication becomes useful and reliable.

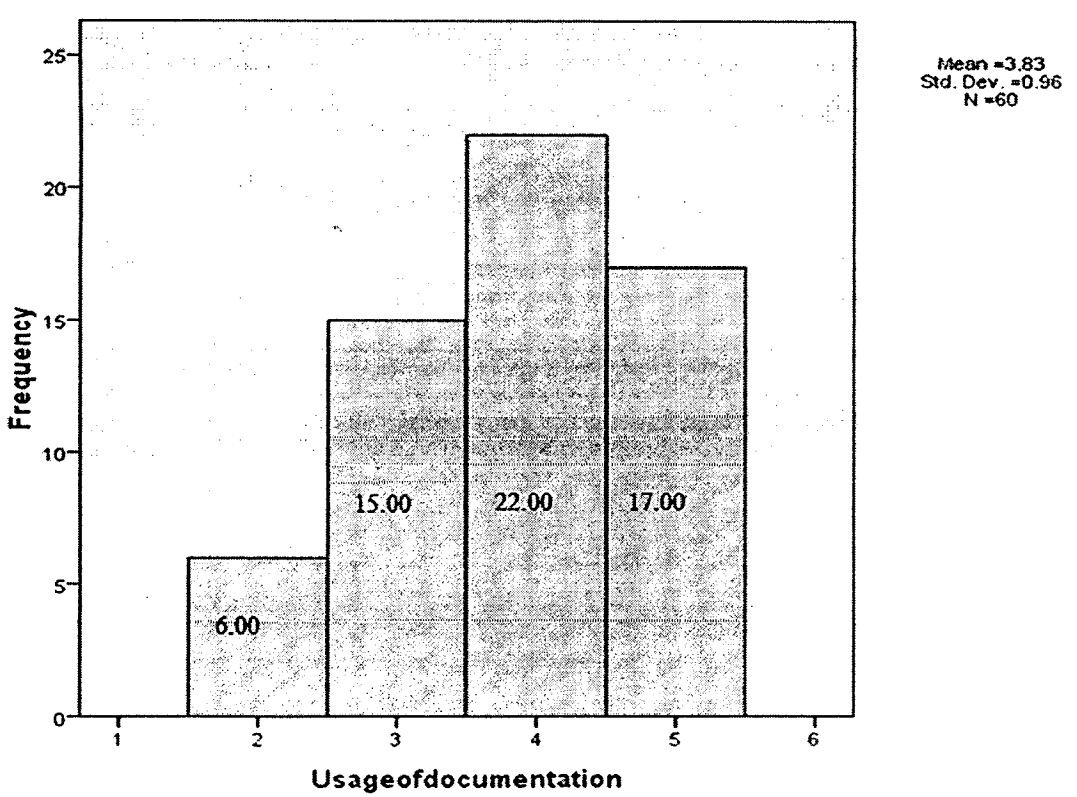

Figure 10: Usage of documentation

On the other hand, it is also obvious that reports and other written documents do not suffice as tools of management. Software programs and devices are instrumental to transmit the necessary information on various matters. It is important to show the correlation between these 3 means so we would be able to assess the relation between them.

Correlations

		Usage of documentation	Accuracy of reports	Usage of software
Usage of documentation	Pearson Correlation	1	.125	.125
	Sig. (2-tailed)		.342	.342
	N	60	60	60
Accuracy of reports	Pearson Correlation	.125	1	.029
	Sig. (2-tailed)	.342		.825
	N	60	60	60
Usage of software	Pearson Correlation	.125	.029	1
	Sig. (2-tailed)	.342	.825	
	N	60	60	60

Table 2 Correlation between usage of documentation/accuracy of reports and usage of software

According to Hanghey, the need of project management is driven by the necessities of the business environment when it realizes the real benefits of (a) organizing work around projects and (b) the critical need to communicate and coordinate work across departments and professions.

In addition to that, we notice that what was cited in the literature review could be verified by the results of our data which are analyzed below. They show that the correlation between the usage of documentation, and their accuracy have some effects on the risk, which could be even more minimized with the usage of software; because as a monitoring and operational device the latter can help in implementing and executing the plan with the lowest risk rate.

5.3 financial risks

It is evident that the execution of international project requires constant follow-ups in many areas. Barriers for entering in particular geographical zones can play significant roles in developing pricing strategies. According to Neumann, in countries where barriers to entry are high, companies tend to be in a better position; they retain a relatively high standing and generate profits without fear of competition.

Financial risk is a factor that should not be omitted during risk assessments. Companies should always consider its impact on their construction operations. On this issue Howard Formana affirms that we have to be careful about the price-sensitive questions, therefore firms have to consider twice before implementing pricing strategies.

The main points that we stressed on financial risk are: the bankruptcy of the project, the fluctuation of monetary system, and low credibility of shareholders.

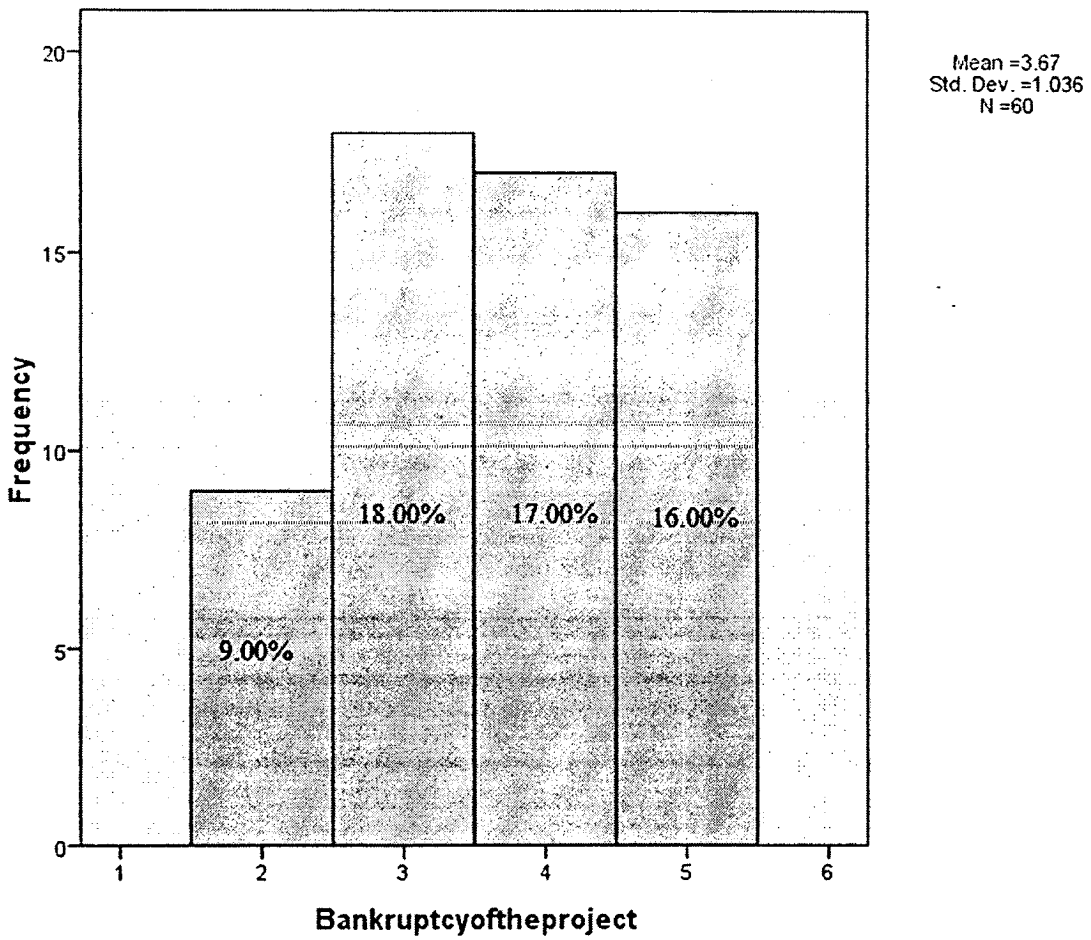

Figure 11: Bankruptcy of the project

As shown in figure 11, the percentage of answers regarding "how the bankruptcy of a project affects the risk in the construction fields" is near identical: indeed some 18 % think it "normal" while 17 % agree that there is a large correlation, and 16 % say that the correlation is very large. Thus we notice the average of the population admits that the bankruptcy of the project does affect the risk of the company; thereby moving to a new territory to implement any project without a very effective pricing strategy could lead to a high risk, such as the bankruptcy of the project defined to be a major risk.

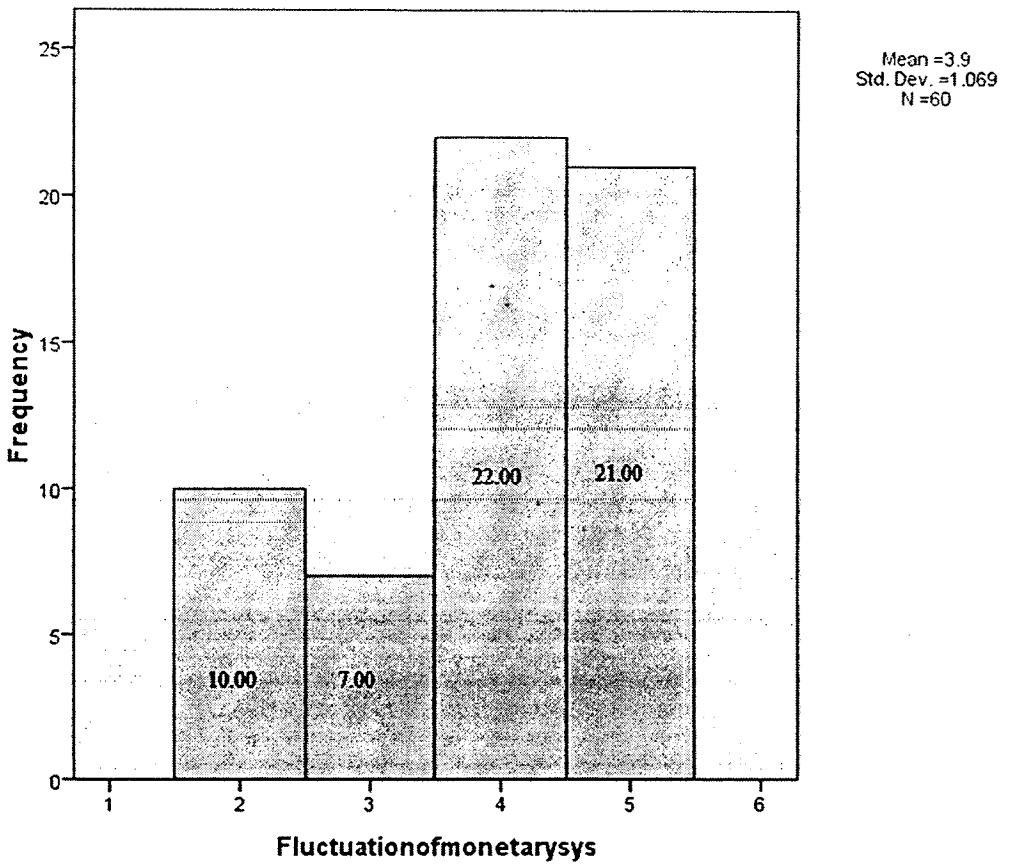

Figure 12: Fluctuation of monetary system

Figure 12 shows that 23% of the population think that the fluctuation of the monetary system largely affect the risk and 21 % of the population think that it has a very large correlation.

In a study published in the International Journal of Project Management, Ankintola and Malcolm observe that financial risk influences the cash flow of construction contractors. At times such a risk may have a direct impact on the projects of site owners; thus some builders are unable to complete their project for lack of funds.

Correlations

		Bankruptcy of the project	Fluctuation of monetary sys	Low credibility of shareholders
Bankruptcy of the project	Pearson Correlation	1	.153	-.124
	Sig. (2-tailed)		.243	.344
	N	60	60	60
Fluctuation of monetary sys	Pearson Correlation	.153	1	.198
	Sig. (2-tailed)	.243		.129
	N	60	60	60
Low credibility of shareholders	Pearson Correlation	-.124	.198	1
	Sig. (2-tailed)	.344	.129	
	N	60	60	60

Table 3: Correlation between the Bankruptcy of the project, Fluctuation of monetary system and the low credibility of shareholders.

Table 3 shows that the correlation between the bankruptcy of the project and the fluctuation is positive where these two means depend on each other. Thus we understand that when there is fluctuation of the monetary system bankruptcy might take place; while this correlation seems to be negative with the low credibility of the shareholders, for each time there is low credibility of shareholders the risk of bankruptcy is higher.

5.4 Technical risk

Today many companies are faced with some technical risks, namely: ''Improper planning and budgeting, improper feasibility studies, and lack of experience.''

Naturally we took these risks in consideration when conducting our survey, but we also included the following: "changes in top management, the incompetence of project managers, improper feasibility study and planning, poor coordination between various departments, poor communication between parties, international management problems, negligence in site inspection, project delay and shortage of time.''

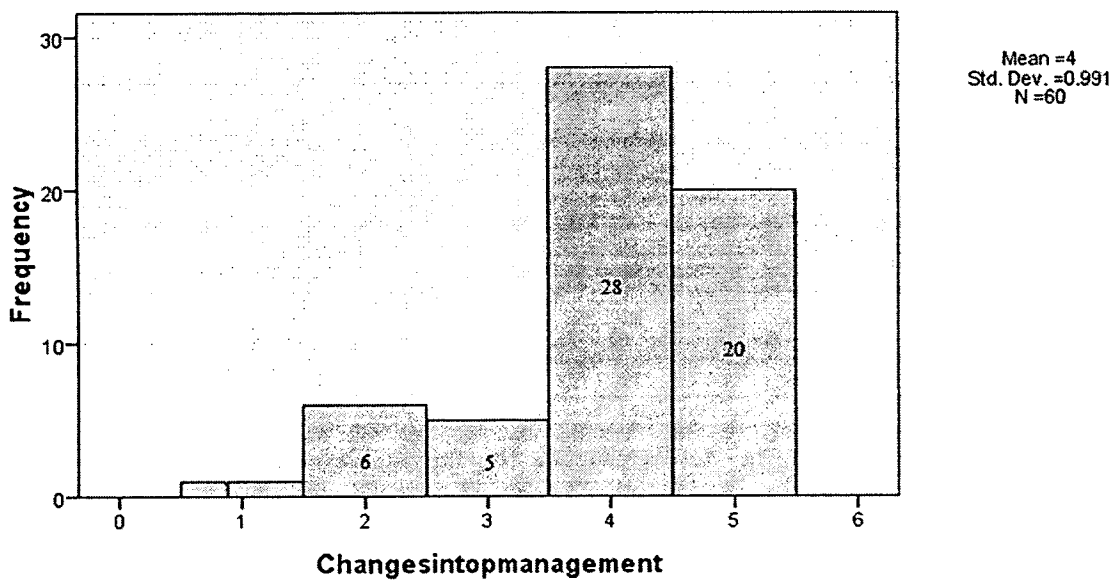

Figure 13: Changes in top management

As shown in figure 13 we notice that the change in top management has considerable impact on the risk in the company where 28 % of the population agrees that it has a large impact on the risk of the company while only 1% thinks it does not affect the risk.

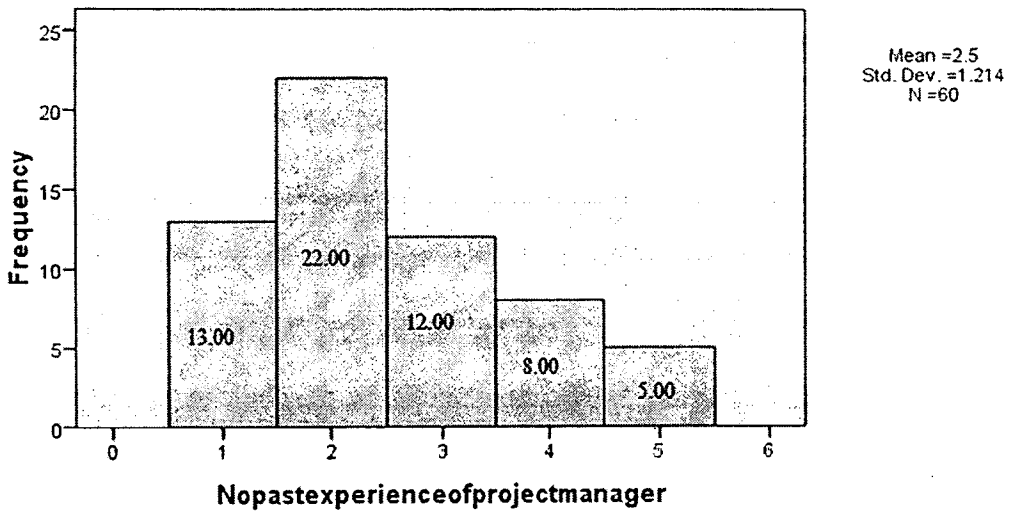

Figure 14: No experience of project manager

Figure 14 reveals first that the lack of experience of the project manager doesn't necessarily affect the risk in the company. In fact, 22% of the population thinks that it has small impact on the company while only 5 % say it has a large impact. On this subject we note that the project manager could have no field experience but emphasize a high level of expertise that would keep him up to date with any job description he is given.

Moreover, upon our analysis of some aspects about technical risk we have noticed the following: when improper feasibility study is executed the impact of the risk isn't as important as during the risk of an improper coordination between parties. In this respect 24 % of respondents (figure 16) acknowledge that the coordination between parties has a very large impact on the risk in the company and plays a major role in it. Meanwhile only 1 % disagreed with this idea.

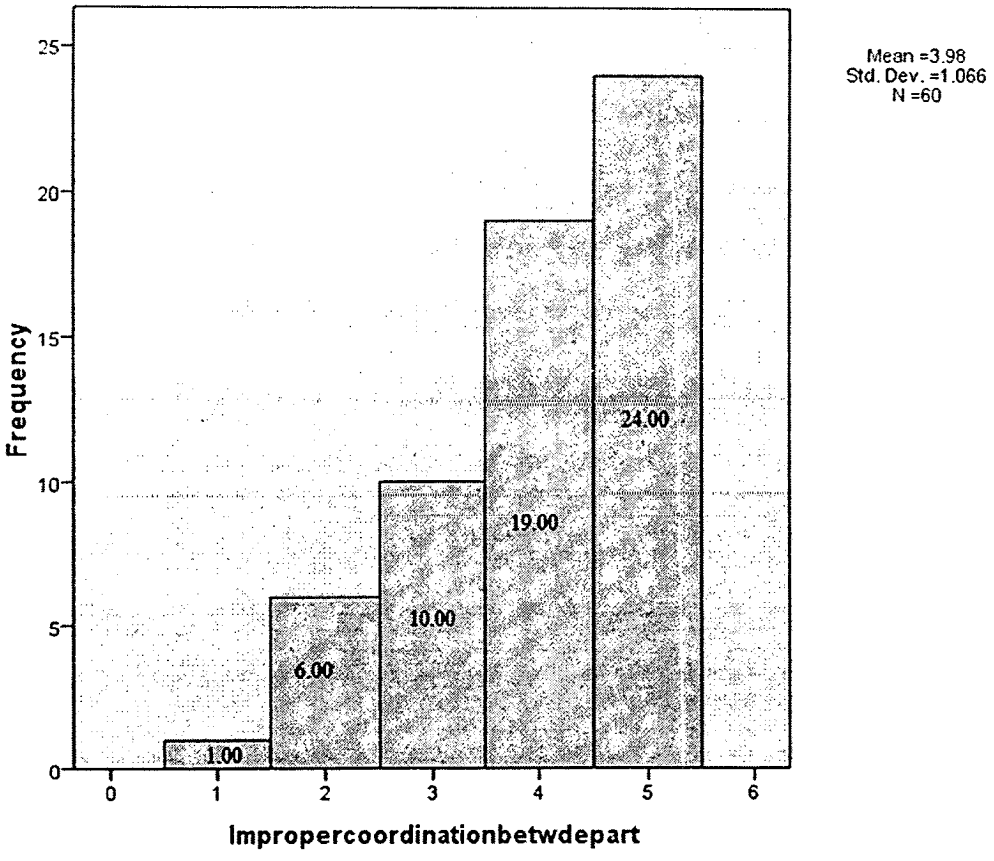

Figure 15: Improper coordination between departments

There are large volumes of studies on the subject of risk management. In this respect, Law and Ngai demonstrate that knowledge sharing and learning contribute to better performance and business process improvement. Eventually, the coordination between departments is a task that entails a good understanding of all issues at stake.

Our survey has shown that when it comes to technical risk the international management problems do not necessarily threaten the course of projects at work. As shown in figure 15, 20% of the total population agrees that the international management problems have small impact on the risk while only 1 % of the total population believes the opposite.

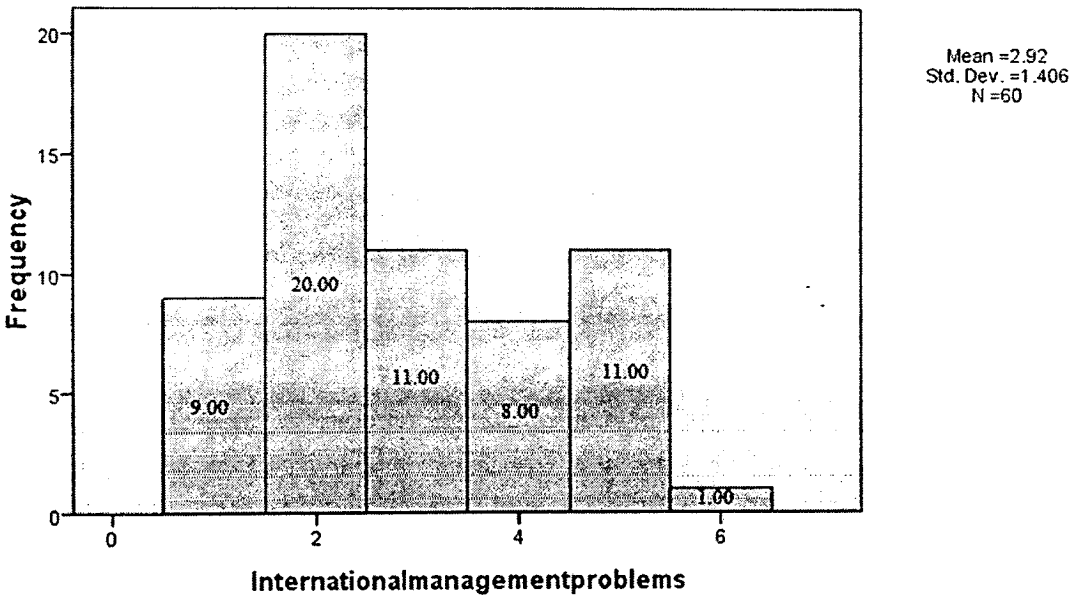

Figure 16: International management problems

Project management ventures always face a series of problems when going international. Schreiber says that when establishing international business operations, company officials should not go after generalizations. The author's statement resonates amid business objectives. Schreiber urges us to consider the concept of ''emerging versus mature markets'' and ''stable versus unstable markets''.

5.5 Market risk

When discussing about market risk we should single out the most important variable in order to define what is important in the mindset of the customers. Here figure 18 shows that 24 % of the population agreed that an inadequate analysis of the market demand has a large impact on the risk of the company. We also notice that none of the respondents answered that it doesn't, or is too insignificant, affect the risk.

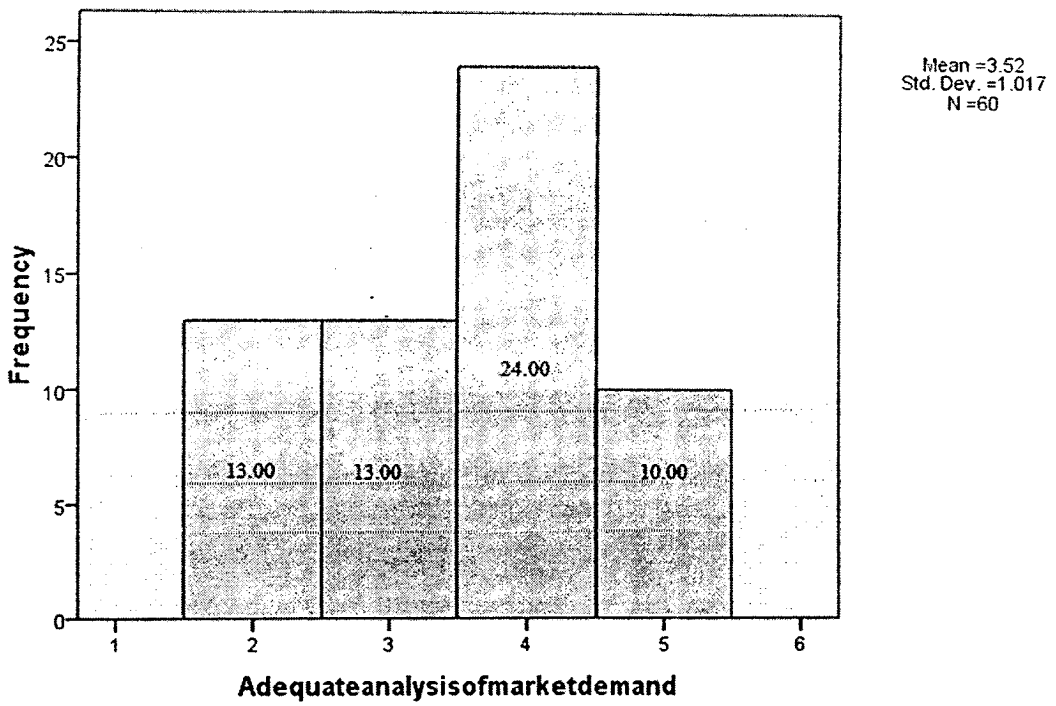

Figure 17: Adequate analysis of market demand

In the international arena of risk management, the adequate analysis of the market has to be thoroughly examined. According to Howard Formana, one major issue to consider is the price sensitivity; therefore it should be to implemented with care.

Also it is important to understand the risk in the selected company. Thus some companies are better positioned and equipped than others in risk assessment; they are in a very powerful position to leverage risk to a competitive advantage. Thus, Davemport and Bradly explain that an adequate analysis of the market leads to a greater knowledge risks, delivering the ability to deal with risk better than competitors and managing risk at lower costs.

5.6 Other risks

In the second chapter we have already cited the works of Norman and Joly about other substantial risks. According to Norman, risk can manifest itself in numerous ways, varying over time and across activities, which in turn is caused by lack of information. He adds that many

variables affect the risk of a certain project if it is related to legal risk or to other environmental risks.

Jolly considers that organizations are facing an increasing number of risks, and there is growing recognition that they must be managed with the total organization in mind. All organizations are required to have a more practical approach in dealing with risk that goes beyond the statistical and analytical to future scenarios and planning.

When it comes to construction fields, the smallest of problems could possibly threaten the whole cycle of the project management; therefore it is important to take into consideration every aspect and be able to know how to analyze the risk, handle it collectively and solve as soon as possible.

The statistical correlation allows the researcher to examine the strength of the relation between two variables. In testing the hypothesis it is surely important to show the significant relation between the dependent and the independent variables. In addition it is crucial to detect the causes of probable risks. Naturally, we have to mention that the risk cannot be analyzed as only a part of the project management process, but rather as an organizational process as well. Hence our decision to divide dependent and independent variables into several sections; each section was analyzed using the SPSS correlation.

One of the hypotheses stresses the point on how the cooperation between parties reduces the risk in the organization. It considers that the improper coordination between departments is the dependent variable while improper planning and feasibility studies, lack of control and poor communication, are the independent ones.

As shown in appendix E, the increase of the improper coordination between departments will necessarily lead to an increase in the improper planning. Poor communication will persist, leading to control collapse and an improper feasibility study, therefore to a higher risk.

Delivery of the project is another dependent variable which we analyzed by considering:"the late approval, climatic disorder, shortage of skillful worker, architect and engineer dispute, error in design, falling short of income."

Appendix E shows that climatic disorder when met with shortage of skillful workers may negatively impact on the project's timetable. Meanwhile, delays due to disputes design errors and budget miscalculations may cause serious problems, but the approval has no significant threat.

As shown in appendix D, lack of control has a major impact on the coordination between parties in addition of the planning, also we notice that when the lack of control increase the international management problems also increases while it isn't necessarily affected y the accident on site or falling short of income.

Finally, risk identification is sometimes considered too weak but at the same time the heart of any process success. There must be a possibility to identify risks and opportunities for focus areas (for example, system-by-system, or supplier-by-supplier) in order to rely on the effectiveness of risk identification.

5.7 Conclusion

This research is an attempt to bridge the gap between the values of management, whether it was at the operation or the project level, and the project documentation.

Either directly or indirectly the vision for the project environment specify the mission of the projects, proposals and portfolios, the whole team must be fully ready to develop detailed plans for achieving the vision through the implementation of their perspectives.

The research has shown that effective communication and coordination of all involved parties in the construction chain is a key characteristic of a useful project management and with the widespread availability of both internet and intranets within the organizations provide significant opportunities for contractor, owners and all other members of the construction project team to enhance communication among the entire team.

Aligning the key performance indicators to the objectives of the business, will not only help project managers to keep track of the project but also to measure and improve performance and what remains an essential success criterion is to exceed customers expectations by completing the project within the stated, "deadlines, budgets and quality". But those criteria's alone aren't solely sufficient to determine the strength of the program, but they can be important indicators of how well a risk management process can be, that's why it is important that the assessment will be in early stages to ensure that all risks are analyzed, thereby incorporated into the planning implementation and budget projection.

Exceeding expectations require a total focus on determining the probability of risk events occurring and to estimate the consequences that might put the project at danger, that's why early efforts need to be conducted to assess the risk thereby provide the company with necessary information to manage within this environment and provides each team with specific directions and basics of planning, in order to achieve the desired outcomes.

In such a risky environment even though all the tools are available to evaluate the risk, it is important to understand how to apply and interpret the results. Despite its complexity, risk assessment is one of the most important phases of the risk process because the caliber and quality of assessment determines the efficiency of the management program that's why the existence of professional software or consultancy companies turns to be a must in some cases.

As we have previously noted, project management is one of the core functions of a business organization, the researcher assumed that this function should be supported by a software as it facilitates the team collaboration, as the main feature provided by the software is scheduling where it provides the ability to draw grant charts, so any changes that encounter the company is monitored and yet analyzed from its early stages.

Using an effective system could help us successfully transfer information about the risk, as sharing risk among the parties, allow managers to sort the source of the risk and thereby focus their attention on the specific resources that should be fixed.

Projects are at the core of the project management activity and the historical experience from previous projects cannot be applied to the one we're achieving and working at, therefore the success of the enterprise project largely depends on the supportive characteristics of the project environment, communication and collaboration between parties.

Uncertainty was defined as an unknown probability of occurrence of an event. The project are influenced by multiple variables to add that risk elements associated with construction projects influence the time, cost and quality performance of the project.

Chapter 6

CONCLUSION & RECOMMENDATIONS

6.1 Introduction

There must have been some form of project management in use since early civilization. It is hard to imagine the Seven Wonders of the Ancient World being built without some form of project management. Nor is it conceivable that past wars or mega projects were successfully carried out without planning, organizing, and controlling. What leaders from the past managed to accomplish without the present knowledge and understanding as well as project management tools available today, is downright amazing!

When we start talking about project management and at a first glance, it might appear that the success of project is related to the tools, techniques and methods or the project planning used, and that project planning efforts must be given great importance. This realistic assumption, commonly accepted among practitioners and researchers, is challenged by the surprising research results.

The study focused on how to manage the complexity of international construction projects where uniqueness leads to higher uncertainty of risk management, and where the communication between the departments is a must especially the project department which is confronted with external risk and the operation department often confronted with internal risk.

Various project management and operations methods were used to reduce the risk in the construction fields but none of them seems to have gained a commonly accepted state for the best practices.

After our research study, we would say that the majority of risk could be avoided if proper actions are taken to improve business practices and to focus on developing a skillful workforce and successful software that can boost the quality of work and that leads to a more efficient risk

management perspective. But we cannot ignore that there will be always a degree of uncertainty that cannot be detected.

Many of the factors shown in the literature review aid in the success of a project management and to reduce the risk especially when we talk about the project life cycle of planning, initiations, execution and controlling, but we have to know that those factors and with all the flow breaks, could be one of the main risk source if there was no clear communication, and a proper co-operation and coordination.

International project risk assessment planning is a process that assists all project participants to handle risks before they become significant problems, but we have to know that the risk and its impact varies over the life cycle of the international projects, that's why it's important to identify the risk from the beginning of the cycle and be able to recognize which one will diminish and which will go along the life cycle of the project and be able to communicate it to all the project staff and operation coordinators in order to monitor the risk from the beginning of it appearance till the end of the project.

Few owners and contractors have developed a process to optimize the portfolio of project risks across the entire project life cycle. As a result, current assessments of international risk often fail to give adequate consideration to how they may change over time.

Companies continually strives to improve communication and cultivate collaboration between departments, as the researcher noticed in his study that the main purpose of the whole project life cycle is to be able to track the project and make sure whether it meets the schedule drawn or not, moreover the operations main role is to maintain an efficient internal process circulation and protect knowledgeable resources and transfer it among the seniors involved in the whole process.

The development of business relationship between the firms grave their experience, and make the link between them an essential asset of the risk management as each party works separately to define the target risk, during the process each party will be executing within the frame of risk grant to it, in order to gather all out coming results enabling the combination of the two parties thereby leading to risk reduction.

As we have seen, the risks in overseas construction projects can be enormous. In order to manage them effectively, a comprehensive method for managing risks during the construction process, particularly in the pre-contracting should be applied.

Implementing overseas projects should be carefully examined, and not only the probability of occurrence of each risk, but also its impact level, should be considered. The risk response methods used in overseas projects should vary from project to project, and should be very flexible in terms of their operations.

6.2 Research problems and limitations

The topic of project management in coordination with the operation department could lead to reduce the international risk is very broad with loads of information that should be high lightened. With regards to the questionnaire it couldn't cover all the area of risk management and the project management weaknesses and strengths as for ethical issues not all respondents provided us with the information we need.

Every company has developed internal models in order to handle the risk that could affect the company and the project planning and not all of them give us an accurate report of the specific questions we ask.

We have to know that construction fields is a risky fields to work within, and with all the political situations going around in the country is difficult to have a risky sector heading straight, it would be risky and many contractors find it difficult to give accurate information about that topic as with lack of time we weren't able to gain the trust of many of the contractors in order to make them give us all the info that we need.

Due to the limits of research time, manpower and budget, only 60 questionnaires were distributed, further study could be more elaborated.

6.3 Recommendation

In preparing the research and developing an understanding of the process, I would be investigating in others, I reflected on my own experience and everyday life, using a number of the tools from the literature and those I was developing myself.

The purpose of the study was to encourage managers to use an integrated approach to risk management and elevate risk management to a senior management team, companies should not analyze each risk separately but should also analyze the correlation of various risks.

Taking the necessarily risk management process enables managers to effectively deal with uncertainty and associated risk and opportunity, enhancing the capability to build value. Therefore emphasize a comprehensive view of risk and risk management, when the risks within the organizations shouldn't be managed severalty.

The researcher believes that the risk management data should be centralized in one software at top level management, and further top management will assign to each party the level of access needed thus each department should acknowledge its risk criteria and act accordingly.

Researcher final recommendations:

- Meetings, programs or seminars should be organized often, where information should be given, showing how each area of work relates to each other and to the overall success of the organization.
- In order for the communication to be successful enough resources should be provided for the personnel for them to have full knowledge about all the risk that might encounter them
- Risk management should be considered as a premium factor in the success of project management and should be done systematically.
- Financial part of the risk should be monitored by the operation staff and financial specialist should handle it carefully as it cannot be handled by engineers or by the project team.

- All employees' voices should be heard for a better communication and coordination so the project flow would be more successful and risk would be managed from early stages with all employees knowing about and being able to handle.
- A project website can be used for compiling and displaying the project program and the association job process reporting
- We must always update actual schedule information and resource usage at a regular intervals (time sheet could be one method to schedule information)

Owners and contractors are being challenged to manage risk while maintaining control and improving performance, however some owners are not familiar with the concept of risk assessment , therefore more studied should show the owner that the risk assessment isn't just a cost but rather an investments so resources are used more efficiently and that will definitely prove the project feasibility.

6.4 Suggestions for future research.

The construction industry is plagued by occupational risky situations and poor working conditions. Occupational risk assessment (ORA) on workplace sites is the first and key step to achieve adequate safety levels, particularly to support decision-making in safety programs. Most construction safety efforts are applied informally under the premise that simply allocating more resources to safety management will improve safety on site.

The main topic of this research is the link assessment between the operations and the project management which could reduce the risk in the construction fields, but an elaboration about this subject could provide a useful handout for many of the recent projects that are developing and also in many of the ancient buildings that should have been re-establish in recent years.

In future work, a bigger sample could be taken into consideration that includes many of the architects and engineers that were involved in the old constructions, the authors will continue the development of risk management software to ensure its applicability and suitability for assessing risks in the construction sector.

Moreover, as the construction industry changes quickly it would be important to investigate ways that perform partial risk management, that mean just in time limitation and monitoring of the real risk factors

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APPENDICES

APPENDIX A: Questionnaire

Questionnaire Structure:

Name of the company:

Location of the company:

Name of the interviewee

Title:

Age:

Sex:

1. How many projects has your organization done in the last few years, and what are their types?

2. How many international business have you conducted?

3. Is the project duration for delivery affected by the location, market and the project complexity?

4. In your opinion , do pre-project planning and research reports identify project risk?

5. Does your company have a risk analysis/management process? (if yes , is there a different process in the international field?)

6. How is the documentation implemented in your organization , and how are the results being documented?

7. Do you evaluate risk in a qualitative or quantitative manner?

8. Has your firm ever used a risk management consultant? (if yes , was it successfully experienced?)

9. How do you follow up on project performance? (usage of software, documentations, ...)

10. What type of project delivery methods have you used in your international projects?

11. What is the major reason for your company to pursue international projects?

12. Do international project have lower , the same , or higher expected risks as domestic projects?

13. What would you consider the key factors related to international projects? (list the top 3)

14. How do you assess the risk before undertaking international projects?

15. In your opinion, does the presence of operation and project managers personnel enhance the assessment of risk?

Rank from 1 to 5

Usage of documentation will affect the risk planning

1	2	3	4	5

Usage of software will affect the risk planning

1	2	3	4	5

The accuracy of reports in affecting the risk planning

1	2	3	4	5

The daily reports effect in affecting the risk planning

1	2	3	4	5

The level at which proper communication affect the risk planning

1	2	3	4	5

APPENDIX B : Ranking

	Affect the risk					Degree of impact				
Usage of software	1	2	3	4	5	1	2	3	4	5
usage of documentation	1	2	3	4	5	1	2	3	4	5
Accuracy of reports	1	2	3	4	5	1	2	3	4	5
Bankruptcy of the project	1	2	3	4	5	1	2	3	4	5
Fluctuation of monetary system	1	2	3	4	5	1	2	3	4	5
Low credibility of shareholders	1	2	3	4	5	1	2	3	4	5
Insurance Risk	1	2	3	4	5	1	2	3	4	5
Improper verification of project contract	1	2	3	4	5	1	2	3	4	5
Changes in top management	1	2	3	4	5	1	2	3	4	5
No past experience of project manager	1	2	3	4	5	1	2	3	4	5
Improper feasibility study	1	2	3	4	5	1	2	3	4	5
Improper planning	1	2	3	4	5	1	2	3	4	5
Improper coordination between departments	1	2	3	4	5	1	2	3	4	5
Poor relation between parties	1	2	3	4	5	1	2	3	4	5
International management problems	1	2	3	4	5	1	2	3	4	5
Lack of controling	1	2	3	4	5	1	2	3	4	5
Short time	1	2	3	4	5	1	2	3	4	5
Project delay	1	2	3	4	5	1	2	3	4	5
Competition from other parties	1	2	3	4	5	1	2	3	4	5
Falling short of income	1	2	3	4	5	1	2	3	4	5
Increase of labor cost	1	2	3	4	5	1	2	3	4	5
Anedequate analysis of market demand	1	2	3	4	5	1	2	3	4	5
Changes in government policies	1	2	3	4	5	1	2	3	4	5
Late approval	1	2	3	4	5	1	2	3	4	5
Accidents on site	1	2	3	4	5	1	2	3	4	5
Errors in Designs	1	2	3	4	5	1	2	3	4	5
Poor quality of procurement	1	2	3	4	5	1	2	3	4	5
Shortage in supply	1	2	3	4	5	1	2	3	4	5
Following governement Codes	1	2	3	4	5	1	2	3	4	5
Theift of materials on Site	1	2	3	4	5	1	2	3	4	5
Architects and engineer disputes	1	2	3	4	5	1	2	3	4	5
Shortage of skillfull worker	1	2	3	4	5	1	2	3	4	5
Climatic disorders	1	2	3	4	5	1	2	3	4	5
Lack of communication	1	2	3	4	5	1	2	3	4	5

APPENDIX C: Documentation Risk

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.169	.882		4.726	.000
	Improperplanning	.212	.122	.225	1.735	.088
	Improperfeasibilitystudy	-.202	.105	-.248	-1.935	.058
	Lackofcontrolling	-.159	.117	-.176	-1.361	.179
	Lackofcommunication	.063	.131	.061	.478	.634

a. Dependent Variable: Impropercoordinationbetwdepart

Correlations

		Improperfeasibilitystudy	Improperplanning	Impropercoordinationbetwdepart	Lackofcommunication	Lackofcontroling
Improperfeasibilitystudy	Pearson Correlation	1	.056	-.254	-.179	.04
	Sig. (2-tailed)		.672	.050	.171	.72
	N	60	60	60	60	6
Improperplanning	Pearson Correlation	.056	1	.167	-.040	.23
	Sig. (2-tailed)	.672		.203	.764	.06
	N	60	60	60	60	6
Impropercoordinationbetwdepart	Pearson Correlation	-.254	.167	1	.106	-.13
	Sig. (2-tailed)	.050	.203		.420	.29
	N	60	60	60	60	6
Lackofcommunication	Pearson Correlation	-.179	-.040	.106	1	-.05
	Sig. (2-tailed)	.171	.764	.420		.68
	N	60	60	60	60	6
Lackofcontrolling	Pearson Correlation	.046	.237	-.138	-.053	
	Sig. (2-tailed)	.728	.068	.294	.685	
	N	60	60	60	60	6

APPENDIX D: Financial Risk

Correlations

		Climaticdisorders	Shortageofskillfullworker	Architectsandengineerdisputes	Errorsindesings	Lateapproval	Adequateanalysisofmarketdemand
Climaticdisorders	Pearson Correlation	1	-.022	-.106	-.021	.090	.286
	Sig. (2-tailed)		.869	.421	.876	.496	.02
	N	60	60	60	60	60	6
Shortageofskillfullworker	Pearson Correlation	-.022	1	.142	-.043	.010	.05
	Sig. (2-tailed)	.869		.277	.743	.939	.67
	N	60	60	60	60	60	6
Architectsandengineerdisputes	Pearson Correlation	-.106	.142	1	-.292*	.002	-.02
	Sig. (2-tailed)	.421	.277		.024	.986	.87
	N	60	60	60	60	60	6
Errorsindesings	Pearson Correlation	-.021	-.043	-.292*	1	.316*	-.17
	Sig. (2-tailed)	.876	.743	.024		.014	.18
	N	60	60	60	60	60	6
Lateapproval	Pearson Correlation	.090	.010	.002	.316*	1	-.21
	Sig. (2-tailed)	.496	.939	.986	.014		.09
	N	60	60	60	60	60	6
Adequateanalysisofmarketdemand	Pearson Correlation	.286*	.056	-.020	-.172	-.216	
	Sig. (2-tailed)	.027	.673	.877	.189	.097	
	N	60	60	60	60	60	6

*. Correlation is significant at the 0.05 level (2-tailed).

APPENDIX E: Technical Risk

Correlations

		Lackofcontrolling	Shortageofskillfullworker	Fallingshortofincome	Accidentsonsite	Poorqualityofprocurement	International management problems	Improperc dinationbet epart
Lackofcontrolling	Pearson Correlation	1	.080	-.171	-.245	.284*	.142	-.1
	Sig. (2-tailed)		.542	.191	.059	.028	.279	.2
	N	60	60	60	60	60	60	
Shortageofskillfullworker	Pearson Correlation	.080	1	.350**	-.110	-.022	.114	-.0
	Sig. (2-tailed)	.542		.006	.402	.865	.387	.7
	N	60	60	60	60	60	60	
Fallingshortofincome	Pearson Correlation	-.171	.350**	1	.125	-.238	.145	.0
	Sig. (2-tailed)	.191	.006		.343	.067	.267	.4
	N	60	60	60	60	60	60	
Accidentsonsite	Pearson Correlation	-.245	-.110	.125	1	-.091	-.090	.3
	Sig. (2-tailed)	.059	.402	.343		.490	.494	.0
	N	60	60	60	60	60	60	
Poorqualityofprocurement	Pearson Correlation	.284*	-.022	-.238	-.091	1	-.076	-.0
	Sig. (2-tailed)	.028	.865	.067	.490		.566	.6
	N	60	60	60	60	60	60	
Internationalmanagement problems	Pearson Correlation	.142	.114	.145	-.090	-.076	1	-.1
	Sig. (2-tailed)	.279	.387	.267	.494	.566		.1
	N	60	60	60	60	60	60	
Impropercoordinationbetwdepart	Pearson Correlation	-.138	-.036	.089	.317*	-.055	-.171	
	Sig. (2-tailed)	.294	.786	.497	.014	.675	.192	
	N	60	60	60	60	60	60	

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).