PROJECT MANAGEMENT CONSULTANCY SERVICES IN TURKISH CONSTRUCTION INDUSTRY

by

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ABSTRACT

PROJECT MANAGEMENT CONSULTANCY SERVICES IN TURKISH CONSTRUCTION INDUSTRY

The construction sector is an important part of national economies all over the world and increases the social and economic welfare of societies. Construction projects are complex in nature and require the coordination of the design teams, consulting teams, suppliers, manufacturers and one or more contractors. Employer teams can face a variety of challenges in project financing, formal procedures, budget, cost and quality management, managing consultants, designers and contractors. Therefore, it is important that employer teams and engineering and construction companies invest in project management services. In this thesis, the construction project management industry in Turkish construction sector is analyzed, the organizations' strengths and weaknesses are identified, the opportunities and threats in the sector are revealed. An interview form is prepared including 39 external factors to evaluate the impact of the sector on firms and 34 internal factors to evaluate the competencies of the firms. Semi-structured interviews have been conducted with the 22 sector professionals, who are actively working in the most prestigious foreign and local construction project management companies in Turkey. SWOT analysis was performed for local and foreign project management companies and project management sector in general using the obtained data from the interviews. The five sector professionals were consulted when creating and evaluating SWOT tables. Strategies were developed for Turkish construction sector accordingly. This field study will provide a detailed analysis to the students, academicians, all stakeholders involved in a construction project and the construction project companies about the Turkish construction project management industry.

ÖZET

TÜRK İNŞAAT SEKTÖRÜNDE PROJE YÖNETİMİ DANIŞMANLIK HİZMETLERİ

İnşaat sektörü, tüm dünyada ulusal ekonomilerin önemli bir bölümünü oluşturmaktadır ve toplumların sosyal ve ekonomik refahını arttırmaktadır. İnşaat projeleri doğası gereği karmaşık olup, tasarım ekibi, danışman ekipleri, tedarikçiler, üreticiler ve bir veya birkaç müteahhittin koordinasyonunu gerektirir. İşveren yetkilileri, proje finansmanında, resmi prosedür takibinde, bütçe, maliyet ve kalite yönetiminde, danışmanları, tasarımcıları ve müteahhitleri yönetme konusunda çok çeşitli zorluklarla karşı karşıya kalabilirler. Bu nedenle, işveren ekiplerinin ve mühendislik ve inşaat şirketlerinin proje yönetimi hizmetlerine yatırım yapması çok önemlidir. Bu tez çalışmasında, Türk inşaat proje yönetimi sektörünü analiz edilerek, inşaat proje yönetimi şirketlerinin Türk inşaat sektöründeki güçlü yanlarını ve zayıf yanlarını belirlenmiş, sektördeki fırsatlar ve tehditler ortaya koyulmuş, buna göre stratejiler oluşturulmuştur. Detaylı bir literatür taraması yapılarak, sektörün firmalar üzerindeki etkisini değerlendirecek 39 faktör ve firmaların yeterliliklerini değerlendirecek 34 faktörden oluşan bir mülakat formu hazırlanmıştır. Türkiye'deki en saygın inşaat proje yönetimi şirketlerinde aktif olarak çalışan sektör profesyonelleri ile 22 mülakat gerçekleştirilmiştir ve elde edilen veriler kullanılarak SWOT analizi yapılmıştır. SWOT tabloları oluşturulurken ve değerlendirilirken beş sektör profesyonelinin görüşleri alınmıştır. Üç SWOT analizinden elde edilen veriler kullanılarak Türk inşaat proje yönetimi sektörü için stratejiler oluşturulmuştur. Bu alan çalışması, inşaat sektörü ile ilişkisi olan öğrenci ve akademisyenlere, inşaat projelerinde görev alan tüm paydaşlara ve inşaat proje yönetimi firmalarına Türk inşaat proje yönetimi sektörü hakkında detaylı bir analiz sunacaktır.

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LIST OF ACRONYMS/ABBREVIATIONS

APMG	Association of Project Managers Group
ATCEA	Association of Turkish Consulting Engineers and Architects
CMAA	Construction Management Association of America
CMP	Construction Management of Standards of Practice
CPM	Critical Path Method
ENAA	Engineering Advancement Association
ENR	Engineering News Record
EPC	Engineering, procurement and construction
EVM	Earned Value Management
GDP	Gross Domestic Product
HSSE	Health, Safety, Security and Environmental
ICB	IPMA Competence Baseline
IPMA	International Project Management Association
IPYD	Istanbul Project Management Association
OGC	Office of Government Commerce
PERT	Project Evaluation Review Technique
PESTEL	Political, economic, social, technological, environmental, legal
PM	Project Management
PMAJ	Project Management Association of Japan
PMBOK	Project Management Body of Knowledge
PMI	Project Management Institute
PRINCE	Projects in Controlled Environments
P2M	Project and Program Management for Enterprise Innovation
SWOT	Strengths, weaknesses, opportunities, threats

1. INTRODUCTION

The foundation of construction project management practices is grounded back to end of 18th century in USA by means of the large-scaled government sponsored construction projects. Then, a major progress for the construction work schedule was achieved in 1910's when Henry Gantt has created the "Gantt Chart". The development of CPM (Critical Path Method) and PERT (Project Evaluation Review Technique) in 1950's is considered to be the turning point of the construction project management practice. (Watt, 2013) The construction management practices commenced in 1960's and 1970's in Turkey and the Association of Turkish Consulting Engineers and Architects (ATCEA / TMMMB) was founded in 1980.

In 1990's, especially after the 1999 Istanbul (Gölcük) Earthquake with the new building laws and regulations in Istanbul, many large scale projects have been constructed both by local and foreign investors. The scales of these projects necessitated good management processes and PM services became more important.

The purpose of this study is to conduct a strategic analysis of the local and international construction project management companies operational in Turkey and establish strategies accordingly. The framework of this study has been constructed after an extensive literature review using the PESTEL analysis, Porter's Five Forces analysis, Strategic Group Analysis and resource-based view. An interview form has been created using the adopted internal and external factors. 22 face-to-face interviews have been conducted out of 32 longlisted companies, which resulted in approximately 69% response rate. According to the results of the interviews, SWOT analysis have been conducted in order to formulate the business strategies. The strategies are formulated for the local companies, international companies and for the construction project management sector in general separately.

1.1. Background of the Research

Construction sector constitutes an important part of the national economies all over the world. The construction industry is of great importance in terms of the economic and technological development of the countries and increases the social and economic welfare of the societies.

Construction projects have their own characteristics. As the location and conditions of construction type varies in each project, production methods also change. Therefore, optimization of construction technology, production technology, manufacturing, cost estimation and process selection is required. Project management in the construction sector ensures that the project is realized in line with the determined targets and eliminating all the risks and problems that may arise during the execution of the construction project.

There are many studies in the literature regarding the construction processes and contractor companies however several studies can be found in the literature about the construction project management practices, especially in Turkey.

The main reason for the need of this study is that the large scale projects ongoing in Turkey for the last 10 years. It is inevitable to employ a 3rd party construction project management company in the large scale projects with local and/or foreign investor. Especially the increase in foreign investments in Turkey has led to an urgent need for the construction project management teams. The international construction project management companies started their operations in Turkey in 1980's and 1990's following this need. Similarly, local construction project management companies started to be established in the same years. Although the demand to the construction project management service increased rapidly, the literature is very limited for the sector analysis in Turkey.

1.2. Problem Statement

The existing studies about the construction project management services is either very theoretical or the studies depend on the case studies or contractor companies. Especially, the internal capabilities are generally measured by the performances in a specific project and external effects of the construction sector on the construction project management companies are not discussed. As a result, a framework needs to be constructed based on the literature review for both external and internal analysis of the companies in order to conduct a sector overview and formulate strategies.

1.3. Aims and Objectives of the Research

The main objective of this study is to have an extensive analysis of how the project management companies operates in Turkish construction sector, reveal their strengths, weaknesses, opportunities and threats and formulate strategies accordingly.

This research aims at meeting the following objectives:

- to ensure that the research will help with filling the gap in literature about project management applications in Turkish construction industry,
- to provide a detailed analysis and results, which will guide the researchers and the construction project management companies on how to utilize their strengths and eliminate their weaknesses and how to make use of their opportunities and overcome the threats in the construction industry.

1.4. Scope and Limitations

In order to attain the purposes mentioned in the previous section, first a comprehensive literature review was performed. In the literature review, the construction project management concept, the concepts of strategic analysis, strategic planning and strategy formulation have been explored. The frameworks of external and internal strategic analysis have been introduced and explained.

The frameworks utilized in the study which are PESTEL analysis, Porter's Five Forces analysis, Strategic Group Analysis and resource-based view are rarely utilized for the construction sector analysis in local and international publishes. Therefore, the adopted factors are sometimes found to be very generic. In order to eliminate this, face-to-face interviews have been conducted with the sector professionals so that the factors are explained in details to them. Also, the face-to-face interviews enabled us being able to receive the feedbacks of the interviewees instantly, receiving their direct comments and opinions on the discussed factors and receiving their further recommendations.

1.5. Organization of the Thesis

This study consists of six chapters. In the first chapter. In the first chapter, the background of the research, problem statement, the aims and objectives of the research, scope and limitations and the organization of the thesis are presented.

Chapter 2 examines the definitions and explanations of project management, project management process groups and knowledge areas, the concept of project management in construction industry and construction project management companies operational in Turkey. Also, the profiles of the construction project management companies are given in Chapter 2.

Chapter 3 comprises the concepts of strategic analysis, strategic planning and strategy formulation. The concept of strategic analysis has been further discussed in terms of external and internal strategic analysis. The external strategic analysis methods utilized in this study has been briefly explained, which are Pestel Analysis Factors (Macro Environment Analysis), Porter's Five Forces (Micro Environment Analysis) and Strategic Group Concept. The internal strategic analysis method of resource based view has also been discussed. Finally, the SWOT analysis method has been given as the strategy formulation tool of the study.

In Chapter 4, research methodology is presented. It includes the proposed framework, semi-structured interview research and administration and content of the inter-

view.

The analysis and research findings are given in Chapter 5 and the conclusions based on research findings and recommendations for future work are presented in Chapter 6.

2. CONSTRUCTION PROJECT MANAGEMENT

2.1. Definition of Project and Construction Project

Project is an action to achieve well-defined goals and objectives under budget and time constraints through clearly defined activities (Şakar, 2000). Project is a process, which is agreed upon in order to to achieve a single and common objective, affected by time, cost and quality constraints and comprising the risk, human resources, communication and distribution components (Steinford, 2000). The project is a set of investments and activities that bring human and material resources together in a planned study in order to achieve the scheduled targets within a certain period of time (Balaban, 2003).

PMI (Project Management Institute). defines the project as a temporary activity designed to produce a unique product, service or result (PMBOK, 2013). The project defined as a temporary activity since it has a specified start and finish date. Project finish is achieved when the project's target is achieved or when it is not possible to fulfill the project's target or when the requirement for the project is off the table. A project may also be finished when the Employer (Client, Customer, etc.) likes to finalize it at a certain point.

According to Balaban (2013), the projects differ from the other works and processes through some features. These features can be summarized as follows;

- Projects are irregular and non-routine works,
- Every project has a target,
- Projects are temporary activities,
- Each project is unique to its nature,
- Projects are generally large-scaled,
- Projects are organized in a non-classical way,
- Projects necessitate changes.

According to PMBOK (2013), the project examples in different sectors can be given as follows;

- Creating an product / service / result,
- Enabling an alteration of an organization's structure, processes, personnel or style,
- Enhancing or implementing a new or altered information system, which may be a hardware or software system,
- Performing a study and analyzing the outcomes properly,
- Constructing infrastructure / transportation / superstructure (residence, mall, hotel) / industrial / water structures projects
- Developing and enhancing the current business processes and procedures.

A Construction Project differs from the projects of other industries through the below given features; (URL-1)

- Fixed product location
- Most projects are non-repetitive, are done only for one time.
- The parties come together only for a specific project, therefore the relations are set for the project only,
- Length of the project duration,
- Customer definition in a construction project differs from other projects,
- Different approaches in determining the roles and responsibilities of the project team and members
- Difficulties in determining cost.

The life cycle of a construction project also differs from the other projects. Barrie and Paulson (1992). defined the life cycle of a construction project in the following 6 phases;

(i) The concept and preliminary design (feasibility). phase is the phase in which the project is defined. In this phase, necessary feasibility and preliminary studies are

carried out and the scope of the project is determined. The resource, cost and time sources are evaluated and assigned to the project processes. The content of this phase is concept analysis, technical and economic feasibility studies and environmental impact reports.

(ii) The engineering and design phase is the stage in which the design phase of the project is clarified and the documents and specifications are prepared according the requirements determined in the concept phase.

(iii) The tender and procurement phase is the stage in which exploration, quantity and tender files are prepared for the contractor and subcontractors according to the data obtained in the design phase and materials and equipment are supplied.

(iv) The construction phase is the phase that starts when the construction works commence and ends with the construction completion.

(v) The initiation and implementation phase is the phase in which all components and features within the project are tested and checked, adjusted and corrected if necessary and the deficiencies in the project are eliminated.

(vi) Operation and commissioning phase is the phase in which all deficiencies in the project are eliminated and the facility becomes operational.

2.2. Definition of Project Management

The concept of project management has been attempted to be defined by many researchers. As one of the earliest attempts, Oisen (1999) defines project management as the application of a collection of tools and techniques to direct the use of diverse resources toward the accomplishment of a unique, complex, one-time task within time, cost and quality constraints. Oisen (1999) claims that each task requires a particular mix of these tools and techniques structured to fit the task environment and life cycle of the task. It can be noticed that the success criteria of time, cost and quality are known as the Iron Triangle, are still being used to define the project management concept today. The British Standard for Project Management (1996) defined project management as the planning, monitoring and control of a project and the motivation of all those involved in it to achieve the project objectives on time and to the specified cost, quality and performance. Lock (1993) argued that the project management evolved

in order to plan, coordinate and control the complex and diverse activities of modern industrial and commercial projects. Burke (1993) emphasized that project management is a specialized management technique, to plan and control projects under a strong single point of responsibility. Turner (1996) suggested that the project management concept can be described as the art and science of converting vision into reality.

According to "A Guide to the Project Management Body of Knowledge" (PMBOK, 2013), project management is defined as the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements. Narrowing down the extent to construction sector, CMAA (2010) defines the project management as the use of integrated systems and procedures by a team of professionals during project design and construction. According to Hendrickson (2008), the concept of project management in construction industry includes a number of objectives that can be achieved by applying a series of processes depending to resource constraints. The objectives of time, cost and quality of project management concept often conflict with the construction specific factors of labor, material and financial resources. These conflicts can be eliminated at the initiation phase of the project by specifying the necessary tradeoffs and creating alternatives in the planning. Project management involves the use of several processes to optimize resources and methods, based on an integrated system of actions designed to achieve specific objectives (TSO, 2009). Nikumbh (2014) stated that a construction project is a temporary undertaking, having specific commencement and completion dates and originates a unique product by its nature. Project management is the art of managing and coordinating human and material resources throughout the life of a project by using management techniques to achieve pre-determined objectives of scope, cost, time, and quality and participation satisfaction.

2.3. Functions of Management

The word "Management" is derived from the Latin word "Manu Agere", which stands for "lead by hand" meaning giving directions (Mahmood and Basharat, 2012). Drucker (1974) defines management as an activity of working out the issues using the

assistance of other people and resources. In order to reach targets, management is utilized by planning, leading, organizing and controlling people in a group (Weijrich and Koontz, 1993). Management also implies the supervision for the necessary actions to follow a work schedule, which means that there should be a well-prepared and precise program for an effective management (Shied, 2010).

Various studies have classified the functions of the management. Some studies claimed that there are four major components of management i.e. planning, organizing, actuating and controlling. Whereas Luther Gullick increased the number of functions to 8 and came up with a key word of POSDCORB. The initials stand for Planning, Organizing, Staffing, Directing, Coordination, and Reporting and Budgeting. However, the most widely accepted management functions are Planning, Organizing, Staffing, Directing and Controlling, which are created by Koontz and O'Donnell, 1972 (URL-2). Following the most widely accepted theory, the management functions are grouped under 5 main functions which actually overlap during the processes in nature and cannot be separated. Each function is dependent and at the same time affects the performance of other functions.

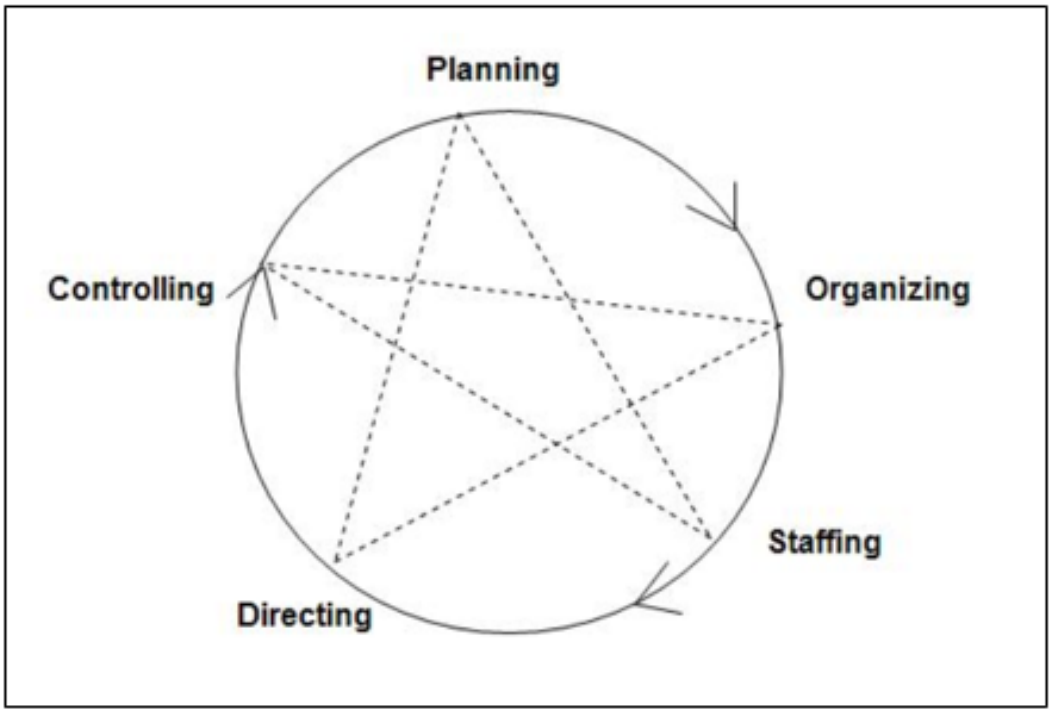

Figure 2.1. Management Functions (URL-2).

Planning. In this functions, the missions and objectives are determined. In order to achieve the targets and realize the missions, the necessary course of actions are selected from alternatives and works schedule is established considering the human and non-human resources. This function enables avoiding the confusion, uncertainties, risks and time and cost overruns in the succeeding functions (Olum, 2004) (URL-2).

Organizing. In this function, the physical, financial and human resources are combined to create a productive relationship among them in order to reach the targets. Organizing a business comprises determining human and non-human resources in the organization. Organizing a process involves:

- Identification of activities.
- Classification of grouping of activities.
- Assignment of duties.
- Delegation of authority and creation of responsibility.
- Coordinating authority and responsibility relationships.

Staffing. It is the function of filling the positions in an organizations and keeping them filled. The staffing function can be achieved by determining the personnel requirement, reviewing the available work force, evaluating, recruiting, promoting, conducting carrier plans so that the jobholders can fulfill their responsibilities properly (Olum, 2004). Staffing function has gained major importance in the last decade because of the recent developments in the technology, the large-scaled businesses and the complexity of human behavior. The major objective of staffing is assigning the right staffs the proper responsibilities. Staffing function comprises the following phases;

- Manpower planning,
- Recruitment and selection of the personnel,
- Training of the personnel and offering development tools,
- Remuneration,
- Regular performance reviews,
- Promotions and Transfer if necessary (URL-2)

Directing / Leading. Directing is encouraging people in a way that they will benefit to the targets of the organization. The problem of this function affecting the managers would be that when the personnel put their desires in front of their professionalism and act as individuals in the groups. Therefore, successful managing requires successful leadership through providing motivation to the personnel, guiding, supervising, and presenting effective management and leadership styles, approaches and communication (Olum, 2004)

Directing function has the following phases:

- Supervision: means observing the performances of the personnel by their managerMotivation: implies motivating and encouraging of the personnel by their managers to work with higher performance. Positive, negative, monetary, non-monetary incentives may be used for this purpose.s and providing feedbacks accordingly.
- Leadership: is the process where the managers effectively directs their personnel in order to track the schedule and achieve the targets.
- Communications: can be defined as transfer of the information, knowledge, knowhow etc. between the personnel providing a tool for understanding within the organization (URL-2)

Controlling. Controlling is the core function where managers should provide the team spirit and harmony among the personnel in order to achieve the targets. All the other functions described above make contribution to the controlling function. Since the individuals tend to have different approaches and different way of behaviors for shared targets in the organizations, the managers' main duty would be reconciling the different behaviors, efforts and interests to synchronize the individual struggles and make advantage of them to achieve organizational goals (Olum, 2004).

According to Koontz and O'Donell (1972). "Controlling is the measurement and correction of performance activities of subordinates in order to make sure that the enterprise objectives and plans desired to obtain them as being accomplished".

Therefore, controlling function has the below phases:

- Establishment of the performance targets,
- Conducting performance reviews to measure the actual performance,
- Comparison of performance targets with the reviewed performances and evaluating the differences if available.
- Performing corrective actions (URL-2)

2.4. Project Management Standards

Project management standards describe how project management applications should be applied in practice. The standards define the basic terms, responsibilities, stages, processes, methods, techniques and tools for the accuracy of the applications. When the same processes and methods are applied in all projects, it may prevent the success of some the projects. Therefore, project managers should be able to determine which processes and methods are appropriate for the project. In order to determine the specific methods, they consult to project management standards that define project management requirements (PMBOK, 2013). In order to customize the project management standards to different sectors, the standards should to be manageable without too many compatibility requirement.

Because of the specific characteristics of construction projects in construction sector, project management standards for the construction projects have been developed by various organizations to meet the demands of the sector. Figure 2.1 summarizes the general characteristics of the international project management organizations examined in this study.

Table 2.1. Project Management Standards.

	PMI	**CMAA**	**IPMA**	**OGC**	**PMAJ**
Origin	USA	North America	Switzerland	UK	Japan
Establishment Year	1969	1982	1965	1975	1998
Nr of Members	over 500 members in 80 countries	more than 14,000 members	72 member countries	over 60,000 members in 57 countries	23 countries

2.4.1. Project Management Institute (PMI) and PMBOK

PMI was founded in 1969 by six project managers in the USA. For the first 10 years, it has been engaged in engineering, defense and construction industry activities. As of 2019, PMI is represented in approximately 80 countries and has 500,000 registered members. The main objective of the organization is to support for the project management profession. Since 1984, the project management certification (PMP® exam). has also been introduced. In 1996, the first Project Management Guide, PMBOK® Guide, was published (URL-3)

The purpose of the PMI organization is to establish project management expertise and science around the world and to advance the way that organizations adopt, evaluate and use project management as a profession. In order to achieve this goal, methods and tools have been developed that cover different activities for fifty years. PMI currently undertakes the individual certification and professional development programs, development of professional standards in project management, organizational competence programs, publications, individual career development programs and project management research and development activities (Ata, 2009).

PMI organizes professional development programs, seminars, conferences and trainings for project management to be accepted and developed as a profession all over the world. In addition, PMI considers the PMBOK standard it has developed as a reference source for project management that is essential for professional development programs and certifications (URL-3).

2.4.2. Project Management Body of Knowledge (PMBOK)

According to PMBOK, project management is the application of knowledge, skills, tools and techniques to project activities in order to meet project requirements. The implementation of information requires effective management of appropriate processes. Project management is carried out through the proper implementation and integration of 42 logically grouped project management processes. These processes were collected in 5 project management stages:

- Initiating Process Group: The processes applied to define a new project or a new phase of an existing project by receiving required approvals for the commencement of the new project or the new phase of an existing project.
- Planning Process Group: The processes performed to clarify the project's scope and targets and the actions to be taken in order to achieve the project's targets.
- Executing Process Group: The processes applied to finish all the works specified in the project management plan in order to fulfill the project's requirements and specifications.
- Monitoring and Controlling Process Group: The processes performed in order to supervise, monitor and evaluate the works performance; specify the issues that require revised action plan and commence the aforementioned revised actions.
- Closing Process Group: The processes applied in order to conclude all activities included in all process groups so that the new project or the new phase of an existing project can formally be closed (PMBOK, 2014).

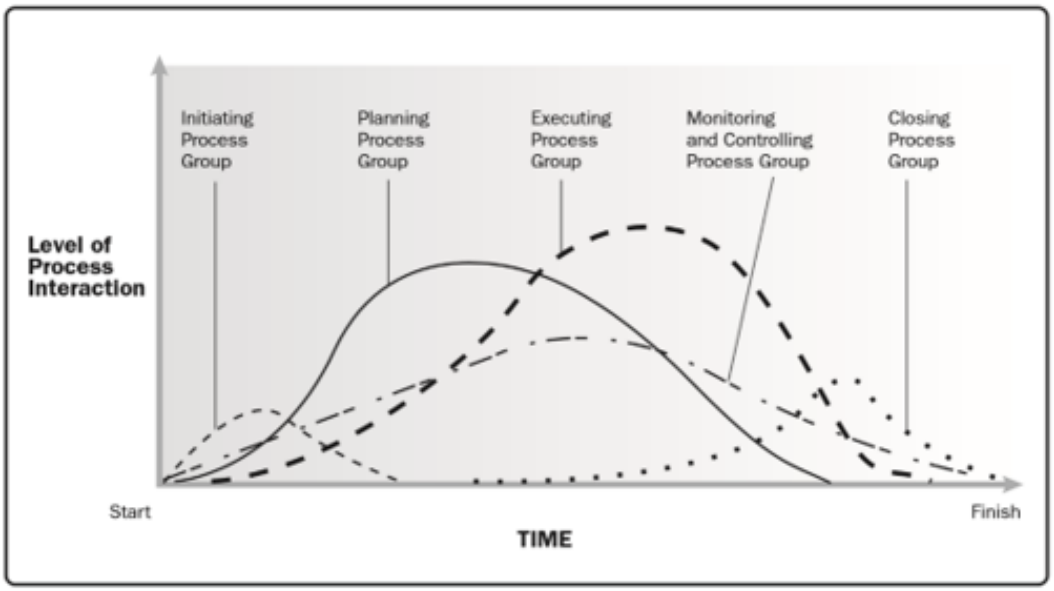

Figure 2.2. Process Group Interactions in a Phase or Project (PMBOK, 2014).

The project management processes are further grouped under ten knowledge areas that are applicable in all sectors worldwide. In the PMBOK, the concept of knowledge area is defined as a whole set of methods, tools and activities that establishes a professional project management field or a specialized area. The knowledge areas are given as below;

- Project Integration Management: The processes and activities performed in order to specify, combine and coordinate all of the processes and project management activities within the Project Management Process Groups from the initiation of the project through the completion.
- Project Scope Management: The processes required in order to make sure that the project includes only the necessary work items in order to complete the project successfully; and the works that are not related with the successful completion of the project are not concerned.
- Project Time Management: The required processes in order to achieve the on time completion of the project including plan schedule management, defining activities, sequencing activities, estimating activity resources and durations, schedule development and schedule controls.

- Project Cost Management: The required processes in order to achieve the project to be completed within the approved budget, including planning and estimating the costs, budget determination and cost controls.
- Project Quality Management: The processes and activities performed in order to ensure that the quality of the project satisfies the quality requirements, including planning quality management, performing quality assurance and monitoring and recording the results of the executing quality activities.
- Project Human Resource Management: The necessary processes in order to organize, manage and lead the project team including creating a staff management plan, acquiring project team, improving the team environment and project team performance management.
- Project Communications Management: The required processes in order to ensure the timely and proper management of project information such as creating, collecting, distributing, storing, retrieving and ultimate disposition of project information according to the communications management plan.
- Project Risk Management: The processes performed including conducting risk management planning, determining the potential risks, and prioritizing the risks with combining their probability of occurrence and impact, analyzing, developing risk responses and monitoring the risks throughout the project.
- Project Procurement Management: The required processes in order to purchase service, material or results from outside the project team.
- Project Stakeholder Management: The processes performed in order to analyze the expectations of the stakeholders and establishing appropriate management strategies for the stakeholders effective in project decisions and execution (PMBOK, 2014).

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
4. Project Integration Management	4.1 Develop Project Charter	4.2 Develop Project Management Plan	4.3 Direct and Manage Project Work	4.4 Monitor and Control Project Work 4.5 Perform Integrated Change Control	4.6 Close Project or Phase
5. Project Scope Management		5.1 Plan Scope Management 5.2 Collect Requirements 5.3 Define Scope 5.4 Create WBS		5.5 Validate Scope 5.6 Control Scope	
6. Project Time Management		6.1 Plan Schedule Management 6.2 Define Activities 6.3 Sequence Activities 6.4 Estimate Activity Resources 6.5 Estimate Activity Durations 6.6 Develop Schedule		6.7 Control Schedule	
7. Project Cost Management		7.1 Plan Cost Management 7.2 Estimate Costs 7.3 Determine Budget		7.4 Control Costs	
8. Project Quality Management		8.1 Plan Quality Management	8.2 Perform Quality Assurance	8.3 Control Quality	
9. Project Human Resource Management		9.1 Plan Human Resource Management	9.2 Acquire Project Team 9.3 Develop Project Team 9.4 Manage Project Team		
10. Project Communications Management		10.1 Plan Communications Management	10.2 Manage Communications	10.3 Control Communications	
11. Project Risk Management		11.1 Plan Risk Management 11.2 Identify Risks 11.3 Perform Qualitative Risk Analysis 11.4 Perform Quantitative Risk Analysis 11.5 Plan Risk Responses		11.6 Control Risks	
12. Project Procurement Management		12.1 Plan Procurement Management	12.2 Conduct Procurements	12.3 Control Procurements	12.4 Close Procurements
13. Project Stakeholder Management	13.1 Identify Stakeholders	13.2 Plan Stakeholder Management	13.3 Manage Stakeholder Engagement	13.4 Control Stakeholder Engagement	

Figure 2.3. Project Management Process Group and Knowledge Area Mapping, (2018).

According to the Construction Extension to PMBOK (2016), Project Management Process Groups defined in the PMBOK (2013). are commonly applied in the project management practices in construction sector as well. The application of these processes however makes the industry and the project unique.

In addition to the ten knowledge areas for the project management processes specified in the PMBOK and described in above section, the Construction Extension to PMBOK (2016). defines two additional knowledge areas for managing the construction projects, which are described below;

- Project Health, Safety, Security and Environmental Management (HSSE): The processes are applied regarding the health, safety, security, and environmental management for construction projects such as site security, controlled access to the construction site and introducing employee health and wellness for construction personnel.
- Project Financial Management: The necessary processes that cover important aspects and considerations with an explanation of industry specific documents, tools, and techniques to better understand and navigate the financial decisions of construction projects.

Please refer to below given Figure 2.4 for the relationship between the Process Groups and Knowledge Areas in construction sector (Construction Extension to PMBOK, 2016).

Knowledge Areas	Project Management Process Groups				
	Initiating Process Group	Planning Process Group	Executing Process Group	Monitoring and Controlling Process Group	Closing Process Group
Project Integration Management	■	■	■	■	■
Project Scope Management		■		■	
Project Schedule Management		■		■	
Project Cost Management		■		■	
Project Quality Management		■	■	■	
Project Resource Management		■	■	●	●
Project Communications Management		■	■	■	
Project Risk Management		■		■	
Project Procurement Management		■	■	■	■
Project Stakeholder Management	■	■	■	■	
Project Health, Safety, Security, and Environmental Management		●	●	●	
Project Financial Management		●		●	

■ *PMBOK® Guide* Knowledge Areas and Process Groups included in *Construction Extension*
● Construction-specific Knowledge Areas and Process Groups unique to *Construction Extension*

Figure 2.4. Process Groups and Knowledge Areas Mapping (Construction Extension to PMBOK, 2016).

2.4.3. Construction Management Association of America (CMAA) and CMP

Established in 1982 in North America, CMAA is the only organization that is dedicated exclusively to construction and program management. The current number of members of this organization is more than fourteen thousand, including individual and institutional members. These members include engineers, architects, construction investors, suppliers, academic staff, educators, students, and others who contribute to the success of the construction sector. They are all very concerned with the excellence of projects that include applications such as timely completion of the project, precise cost control, and optimal use of all resources (CMAA, 2010).

The aim of this organization is to provide development of the construction project management procedures by targeting leadership, professionalism and excellence. CMAA considers itself to be a recognized authority in the management and development of construction projects and programs. CMAA guides the adoption and development of construction project management, which adds value to the entire construction process as a professional discipline. To this end, trainings are held in many countries, construction project management certificate programs are conducted and conferences are held. At the same time, Construction Management of Standards of Practice (CMP) has been developed to serve construction project management (CMAA, 2010).

2.4.4. Construction Management of Standards of Practice (CMP)

The CMP standard, which serves professional construction management developed by CMAA, has been prepared as an indispensable guide for engineers, architects, construction investors, academicians, etc. This standard is accepted and implemented by many countries around the world. In Turkey, CMP was translated into Turkish by Professor Dr. Dogan Sorguc and Dr. Murat Kuruoğlu and published by the Chamber of Civil Engineers (IMO).

This standard describes the processes, project management knowledge areas, tools, techniques and methods deemed necessary for the successful management of

construction projects. The CMP standard is structured on a matrix of six project management knowledge areas and five project management processes. Information covering the tools, techniques and methods necessary for the successful execution of construction projects includes six basic functions (Sorguç and Kuruoğlu, 2007):

- Project Management
- Cost Management
- Time Management
- Quality Management
- Contract Execution
- HSE Management

These functions are not independent of each other and are related and complementary elements of the project management process. The five project management phases where construction project management knowledge areas are examined are listed as follows:

- Preliminary design stage,
- Design stage,
- Tender and procurement stage,
- Construction phase,
- Post-construction stage.

2.4.4.1. International Project Management Association (IPMA) and ICB. IPMA is the oldest international project management organization in the world. The main idea of this organization started to be shaped in the 1960s where ideas, information and experiences on project management were shared in the forums. In 1965, a small group of project management pioneers, a new discipline, came together in Vienna and decided to form a group called "INTERNET". In 1972, this group became IPMA and became a project management organization aiming to improve project management all over the world and to gather project managers under one roof (Stretton, 2007). The goal of the

founders in establishing this organization is to provide a platform for people involved in project management to train themselves, to communicate with each other, and to share and discuss their ideas and experiences.

From originally being a forum for international project managers to share their experiences, this organization became a federation of the leading Project Management associations of its member companies. IPMA is mainly present in Europa since it is based in central Switzerland and has spread to Asia, America and Africa with around 72 member countries. IPMA today runs a world-leading certification program, sets global standards and promotes project management as a profession (URL-4). IPMA offers project manager certification programs and developed the "IPMA Competence Baseline" (ICB)standard.

2.4.5. IPMA Competence Baseline (ICB)

The ICB includes the basic terms, tasks, competencies, functions, management processes, methods, techniques and tools commonly used in project management, but there is no detailed explanation of how these elements should be applied to the project. ICB provides the basis for certification programs and national project management associations affiliated to IPMA.

Instead of defining project management procedures and processes, ICB focuses on the competencies of the project manager. From this point of view according to IPMA, the "eye" symbol of ICB makes sense. IPMA's of Eye of Competence symbolizes human beings and collects project management competencies under three main headings (conceptual, behavioral, and technical) (IPMA, 2006).

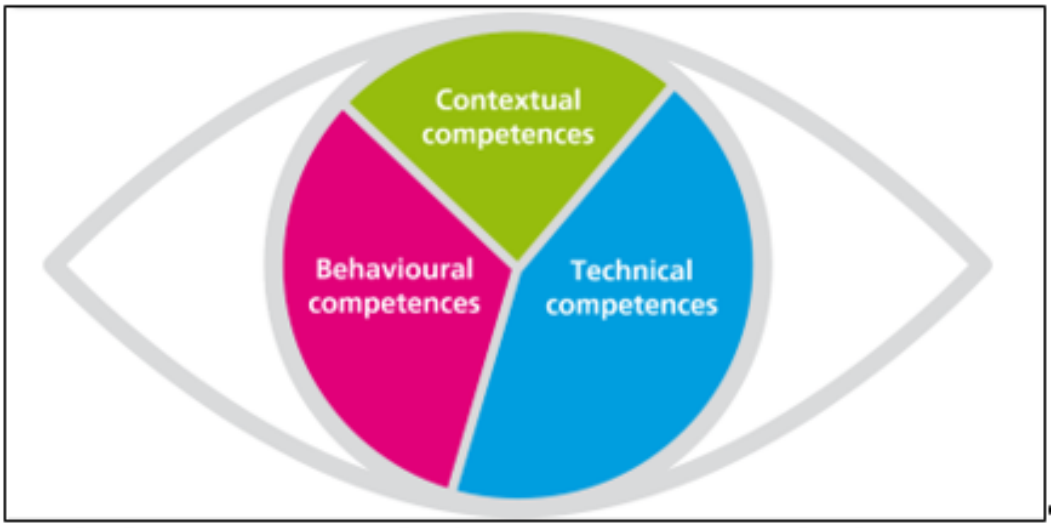

Figure 2.5. The Eye of Competence (IPMA, 2006).

The objective of IPMA to develop this standard is to ensure the development of project management experts and the progress of project management practices. IPMA states that developing a common project management language similar to ICB and PMBOK is very important for project management as a profession. The ICB defines a total of 46 competency components in three areas that it classifies as technical, behavioral and conceptual competences. Each competence component includes a title, a description of the content, a list of possible processes, and the necessary experience criteria for each level. The key relationships between these components are listed at the end of each component's disclosure (Ata, 2009).

Competence is the sum of the knowledge, personal qualifications, skills and experience necessary to succeed in a business. These competencies are divided into subgroups so that project management experts can measure their competencies and managers can evaluate the competencies of the project management team. ICB (Version 3). combines these competencies into three groups:

(i) Technical competencies: This group includes twenty core project management competencies.

(ii) Behavioral competencies: This group includes fifteen project management competencies, which include the capabilities and behavior of project management experts.

(iii) Conceptual competencies: This group includes eleven competencies, including the competence of the project manager to manage and be effective in taking into account the organizational structure.

Competence groups and the project management components included in these groups are shown in Figure 2.6:

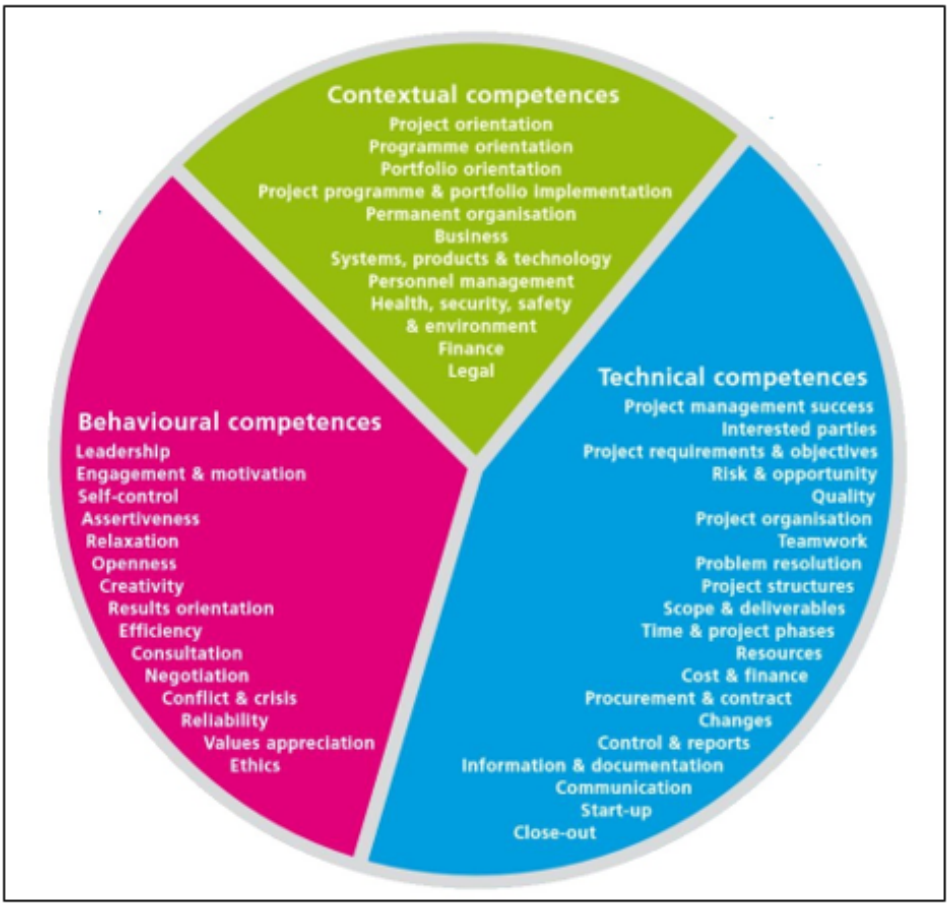

Figure 2.6. Project Management Components in Competence Groups (IPMA, 2006).

2.4.5.1. Office of Government Commerce (OGC) and PRINCE2. In 1975, the Office of Government Commerce (OGC). launched a project named "PROMPTII-Project Reporting, Organization and Management Planning Technique" to ensure that project

management is recognized as a profession and to improve project management practices. In 1989 the name of the project is changed as "PRINCE-Projects in Controlled Environments". The aim of this project is to develop a system that ensures a logical, proper and coordinated project management with described activities. In 1996, with the support of the British government and the private sector, the PRINCE methodology was reorganized to a more general scope and applicable to all public projects and the revised project is launched named PRINCE2 (URL-5).

2.4.6. Projects in Controlled Environments (PRINCE2)

The PRINCE2, the abbreviation of "PRojects IN Controlled Environments", is developed by the UK government and accepted as the project management standard of the UK. The "2" refers to the 2nd launch of the PRINCE project. Formerly developed for use in the IT sector, the system was developed to have a say in a general field of application. PRINCE2 is managed by a team specialized in accreditation and certification called "Association of Project Managers Group-APMG. This team works and develops standards on individuals and organizations that are related to different management disciplines in many sectors in the UK. Following these developments in the United Kingdom, this standard began to attract interest from the Netherlands, Belgium, Germany, Spain, South Africa, Australia, Poland, China, Denmark and the United States (Ataman, 2010). The PRINCE2 system includes the development of standards governing project management practices and certification work of project management experts based on these standards (Ata, 2009). Following its launch in 2006, two major revisions have been applied to PRINCE2: "PRINCE2: 2009 Refresh" in 2009, and "PRINCE2 2017 Update" in 2017. The justification for the 2017 update was the evolutions in practical business practices and feedbacks from PRINCE2 practitioners in the actual project environment (URL-7). According to Managing Successful Projects with PRINCE2 (2017), the structure of PRINCE2 comprises 7 principles, 7 themes and 7 processes as shown in Figure 2.7.

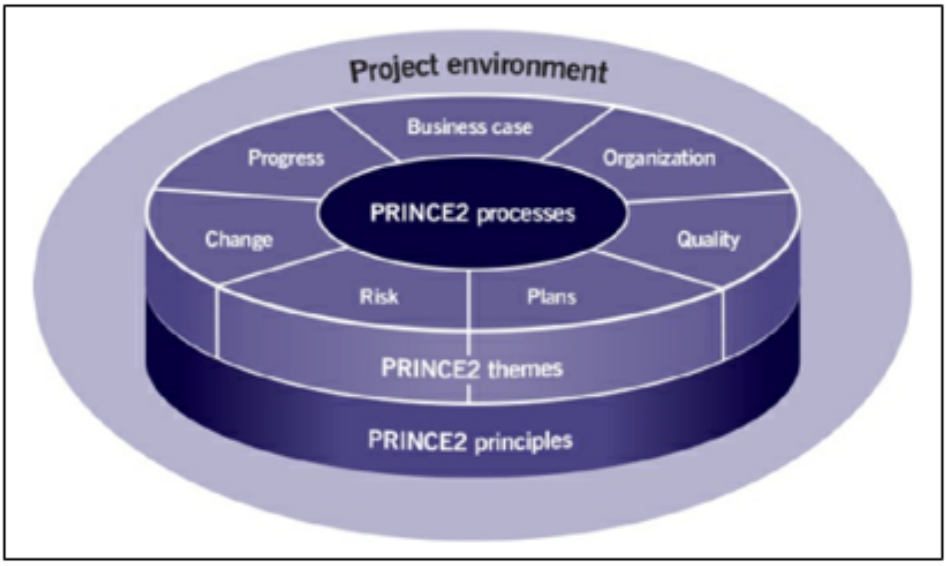

Figure 2.7. The Structure of PRINCE2 (PRINCE2, 2017).

The seven PRINCE2 principles are the overruling restrictions and benchmark practices that determine whether a project is really being managed using PRINCE2. These principles are given below;

(i) Continued Business Justification: The business status is updated at every stage of the project to ensure that the project is still viable. The discontinuity of business may cause early termination of the project.

(ii) Learn From Experience: For each project, a log should be kept for the identified lessons and the project management team should regularly refer to their own log and also previous and concurrent projects' lesson logs in order to prevent experiencing the same problems again. If the lessons lead to changes, they become lessons learned.

(iii) Defined Roles and Responsibilities: The roles in PRINCE2 are graded in four levels i.e. corporate or programme management, project board, project manager level and team level. Project Management Team constitutes the last three, where all other primary stakeholders (business, user, and supplier). need to be presented.

(iv) Manage by Stages: All projects are scheduled in the breakdown of stages. Proceeding to the next stage requires updating the business status, risks, overall plan

and thorough planning of the next stage accordingly.

(v) Manage by Exception: There are 6 tolerances in every PRINCE2 projects that are cost, time, quality, scope, benefits and risk limits. When it is foreseen that one or more of these tolerances are exceeded, it should be escalated to the next higher management level for the decision on the mitigations to be taken and way forward.

(vi) Focus on Products: The major concern of a PRINCE2 is the identification and completion of the products fulfilling the quality requirements.

(vii) Tailor to Suit Project Environment: PRINCE2 is tailored to suit the project environment, size, complexity, importance, time capability and risk. Tailoring is the first activity in the process of project initiation and reviewed for each stage (PRINCE2, 2017).

There are 7 PRINCE2 themes that implies to different aspects of project management that must be referred to continually as the project progresses through its lifecycle. These themes are Business Care, Organization, Quality, Plans Risk, Change and Progress (PRINCE2, 2017). The 7 PRINCE2 processes address the chronological life cycle of the project, which are Starting up a Project, Initiating a Project, Directing a Project, Controlling a Stage, Managing Product Delivery, Managing Stage Boundaries and Closing a Project (PRINCE2, 2017).

2.4.6.1. Project Management Association of Japan (PMAJ). and P2M. In 1999, with the growing interest in project management around the world, the Ministry of Economic, Trade and Industry in Japan adopted a joint system and practical guide for the regular allocation of Japanese experience and knowledge to project and program management in the Japanese industry and to improve and enhance the competitiveness of the Japanese industry. In order to realize this vision, Engineering Advancement Association (ENAA), which is a non-profitable project industry initiative, was established to transfer managerial technology to other related units. With this vision and research budget, ENAA established the Innovative Project Management Model Development Committee under the chairmanship of Professor Shigenobu Chara of the

Chiba Institute of Technology and employed industry-leading project management experts, knowledgeable academics, management consultants and business strategists with project work backgrounds. After 3 years of research and development activities, the Committee promoted the launch of "P2M-Project and Program Management for Enterprise Innovation" (P2M, 2005)

In Japan, large-scale project management studies were conducted in the last half of the 1990s and in 1997, a meticulous project management department was established at the Chiba Institute of Technology. The Japan Project Management Forum (JPMF). was founded in 1998 as a cross-sectoral communication and development community for project management professionals, practitioners, trainers and sales professionals. In cooperation with the Engineering Advancement Association (ENAA), JPMF hosted Japan's first international project management conference in November 2001 with 460 delegates from 23 countries. In International Project Management Congress (IPMC), "P2M-Project and Program Management for Enterprise Innovation" was announced to the world in 2001 (P2M, 2005).

2.4.7. Project and Program Management for Enterprise Innovation (P2M)

The second generation project management of P2M, v2 (2005). Concentrates on planning and control processes, it emphasizes the features of first generation project management, P2M, v1 (2001), which can be classified as difficult processes of project management and emphasizes moderate processes such as organization and communication management. This second generation project management adopts a balanced process structure of wider applicability. It foresees the use of projects with organizational competitiveness as well as meeting external sponsor requirements such as capital investment and system development. As a result, project management has significantly expanded its application areas. The F-B-C concept "faster-better-cheaper" applies to national policy development, consultancy, productivity development, information technology / information services, and product and services development (P2M, 2005).

While P2M still needs to evolve, it aims to make a third generation available. Now, in Japan, all systems need to be restructured from a holistic perspective, such as institutional business structures, public works and public services, which need to adapt to changes in the environment. The approach required for this invention is not based on analytical skills, but rather on a broad vision, value consciousness and intuition that enables one to predict future opportunities. The project management philosophy outlined in P2M (2005). is concerned with finding appropriate solutions through programs consisting of projects involving interrelated relationships, interpreting and developing missions for groundbreaking discoveries, and solving complex issues. In other words, P2M extends existing project management knowledge areas or qualification standards to the full scope project management (P2M, 2005).

2.5. Global Construction Market

2.5.1. General Overview

With the effect of globalization, the construction has become a major "export" market. Chinese, Japanese and Korean construction companies have crossed their borders and are easily able to compete in many developing countries, including the United States, Canada, Brazil, the UK, Europe, Australia, South Africa. These international contractors also offer healthy competition in their competitors' internal markets, often entering into joint venture contracts and offering new methods (O'Neil, 2019)

Engineering News Record (ENR) publishes the Top 400 Contractors list every year. ENR lists the firms based on their construction revenue in ($) millions. ENR (2019) declares that these 400 contractors generated $405 billion in contracting revenue in 2018. This revenue is 8,3% more than 2017's contracting revenue of $373,98 billion.

The global construction sector has cycles at regular intervals. Due to the global financial crisis of 2007-2008, there was a market boom in North America, Ireland, Spain, Dubai and Malaysia and all other countries. As a result, dozens of property developers went bankrupt, followed by banks, contractors and supply chains, or suffered a severe

financial blow. In these countries and in other countries, governments have had to establish special rescue institutions to resolve the confusion that lasted several years (O'Neil, 2019).

After a decade of growth (2008-2018), the global construction cycle reached its peak. While the growth rate in 2018 was 3.5% y/y annually, which was the highest rate in 2008-2018 cycle and quicker than the world economy, this year (2019). it will gradually decrease to 3% y/y for the global construction industry.

In the last decade, most of the growth came from emerging markets (57% since 2008). Developed markets have not fully recovered their volumes after the 2007-2008 crisis. The slowdown in GDP growth and tighter financial and monetary conditions explain the slowdown in the housing sector (+ 3% in 2019 after + 3.5% in 2018 and + 4% in 2017) (Euler Hermes, 2018).

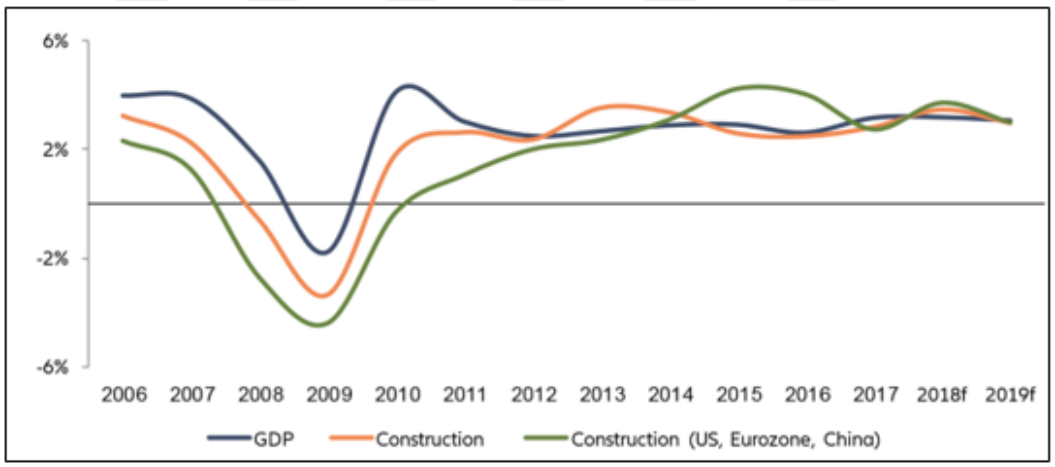

Figure 2.8. Global Construction Industry vs Global GDP (real USD, %change y/y) (Euler Hermes, 2018).

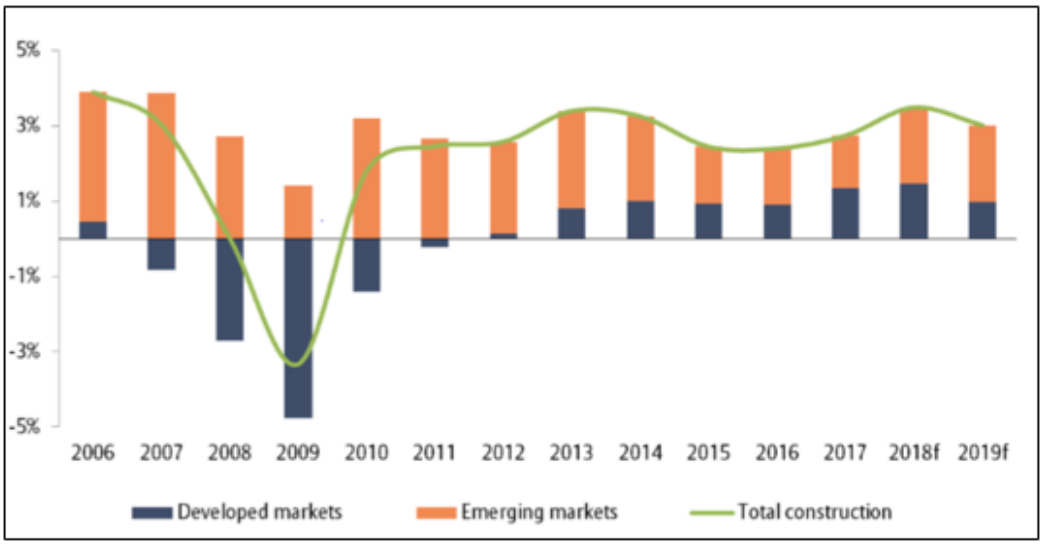

Figure 2.9. Global Construction Industry Growth for Developed and Emerging Markets (real USD, %change y/y) (Euler Hermes, 2018).

Since the emerging markets were responsible for the major ratio of the growth, they will be responsible for the most of the deceleration as well. Emerging economies are expected to suffer from global political risks, trade uncertainties and far more challenging credit conditions. In this context, instability will prevail in many developing countries, which will put construction projects at risk (Euler Hermes, 2018).

Among the commercial, residential and infrastructure segments, the volume of residential sector is dominating in determining the trend. Therefore when the residential sector started to decelerate in 2017 (4,2%), it was bad news for the global construction sector since the residential construction sector is approximately 40% of the global construction sector. Throughout the current global construction cycle, the infrastructure sector, which depends on political decision-making, has entered a cycle of its own. After a gradual slowdown of nine years, the infrastructure sector started to accelerate as of 2016 (Euler Hermes, 2018).

The commercial segment, which tends to follow the housing cycle, may begin to slow down earlier this year. In the commercial real estate segment, it has to deal with its own problems as it adapts to the structural changes created by the double-digit growth

of global online sales. Since global public debt is now at the highest level after 2008, the low performance of the infrastructure segment, which started in 2016 and lasted for years, cannot be expected to improve (Euler Hermes, 2018). Figure 2.9 presents the growth of residential, commercial and infrastructure construction industries in global between 2006 and 2019 (Euler Hermes, 2018)

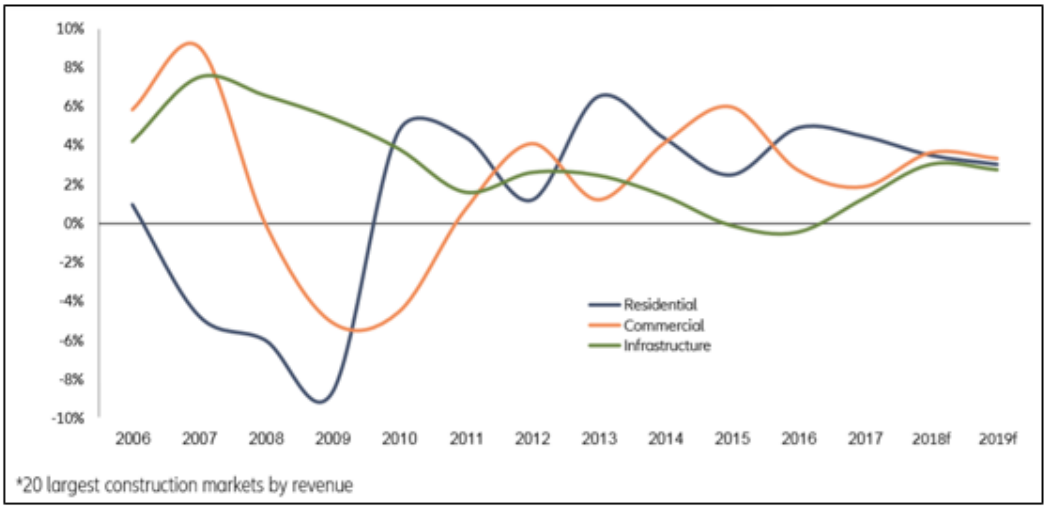

Figure 2.10. Global Construction Industry Growth in the 20 Largest Construction Markets by Revenue (real USD, %change y/y) (Euler Hermes, 2018).

In 2018, 12 of the top 20 largest residential construction markets decelerated. In the upcoming years, the housing sectors in each country are expected to closely follow the overall economic cycle of each country. Therefore, a slowdown is expected in developed markets except Australia and Germany. India, the UAE, China and Indonesia will be the only major market expected to accelerate growth in the housing sector in 2018. In 2019, slowdown in residential construction is expected in all developed markets except Germany, France, Japan, Italy and South Korea.

	2 017	2018f	2019f
1. China	4%	5%	4%
2. US	6%	4%	3%
3. Japan	2%	1%	1%
4. India	2%	10%	9%
5. UK	9%	2%	2%
6. Germany	2%	2%	3%
7. France	4%	2%	2%
8. Australia	-1%	1%	-4%
9. Indonesia	6%	6%	5%
10. Canada	5%	4%	2%
11. Italy	2%	1%	2%
12. Russia	-3%	-4%	2%
13. Brazil	-5%	-1%	3%
14. Mexico	2%	0%	0%
15. Spain	7%	6%	4%
16. South Korea	16%	0%	2%
17. Turkey	8%	4%	2%
18. UAE	-2%	5%	4%
19. Saudi Arabia	-3%	-2%	2%
20. Netherlands	12%	9%	2%
Global	4,2%	3,5%	3%

Figure 2.11. Residential Construction Volumes Growth of Top 20 Construction Markets (Euler Hermes, 2018).

In addition, the global construction sector experienced mining, oil, gas and heavy industry booms. From 2003 to 2014, Brazil, Chile and Australia rose in the mining boom with large export markets. Despite the drop in prices in mining, it still had a large business volume for these countries. Mining and oil and gas boom cycles have been good for engineering contractors because these industries have been directed to EPC contracts (engineering, procurement and construction), which in most cases are 'cost plus' contracts with wealthy clients. These customers were financially strong due to the rise in oil, natural gas and mineral prices, and wanted their projects to be delivered as quickly as possible (O'Neil, 2019).

2.5.2. Role of Construction Project Management in Global Markets

Ochieng *et al.* (2018), claims that there are very few studies conducted regarding the role of project management in global construction industry. The construction projects are complex by nature and require supply chain, design team, consultant teams, one or several contractors and the project management team. The project managers in the global construction industry may confront with unique challenges in managing clients, financiers, developers, designers and contractors from different countries (Management of Global Construction Projects, 2018)

Although considerable progress has been made in establishing and maintaining systematic project management systems, projects do not consistently achieve their goals. This is because engineering and construction firms and owners are having trouble keeping up with the ongoing rapid increase in project scale and complexity. It is surprising that experienced project teams ignore the warning signs of incomplete planning and continue to run the project despite serious and unresolved issues. For this reason, it is very important that business owners and engineering and construction companies continue to invest in project controls and technology. This should help ensure that basic controls are managed in a healthy and consistent manner and that project information systems and tools provide management with the information they need. If management is not informed of project problems until it turns into disaster, the chances of rescuing a project and avoiding failure are reduced to zero (PMG's Global Construction Survey, 2016)

The below Figure 2.12 represents the owners' utilization of project management control systems. 49% of the owners claim that the PM controls are set and standardized for all projects however only regular testing is being conducted for the effective coordination. 20% claims that the PM controls are set, standardized and are under real-time monitoring. 26% of the owners think that there are no well determined control frameworks and 5% have the idea that the project environment is very unpredictable and the project controls are not adequately set, monitored and documented.

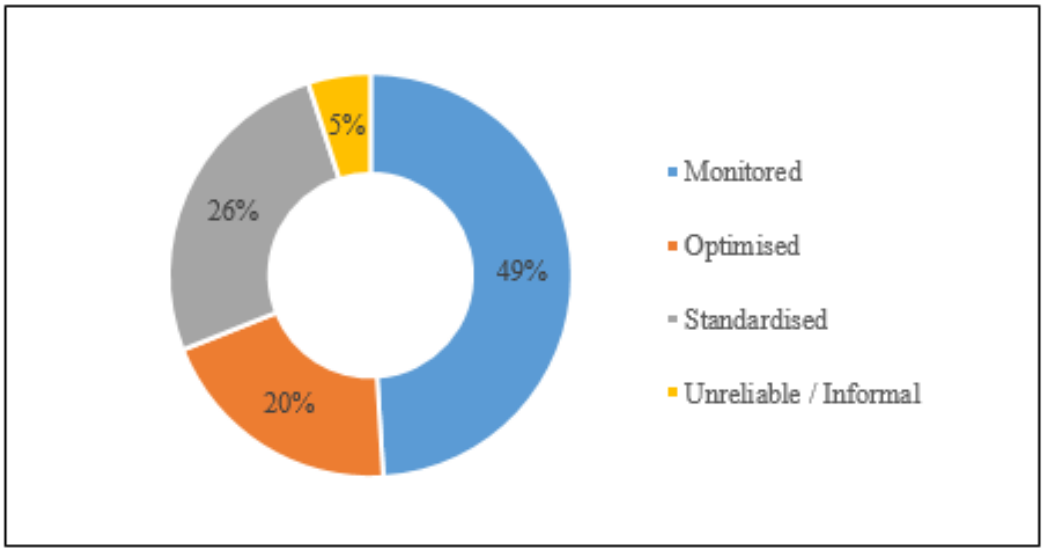

Figure 2.12. Owners' Project Management Controls (KPMG Global Construction Survey, 2016).

The KPMG report (2016) investigated with the owners and the contractors if the Earned Value Management (EVM). Tools are integrated to the construction projects. Earned value management is a project management technique for measuring project performance and progress, combining measurements of the project management triangle: scope, time, and costs (URL-8). Project managements and clients are required to be aware of project facts in real time - or close to real time - basis. EVM is a recognized and consistent approach in the construction industry to measure cost and timing performance. By measuring scope, time and costs within a single integrated system, EVM can provide accurate estimates of project performance issues. The engineering and construction sector has adopted this approach, but its utilization varies. As shown in Figure 2.11, 47% of the project owners and 33% of the contractors do not use EVM. Several owners have the ability, experience, willingness and funding to invest in technology that enables project managers to use the EVM. Some owners even claimed that they do not believe that EVM is necessary for most of their projects (KPMG Global Construction Survey, 2016).

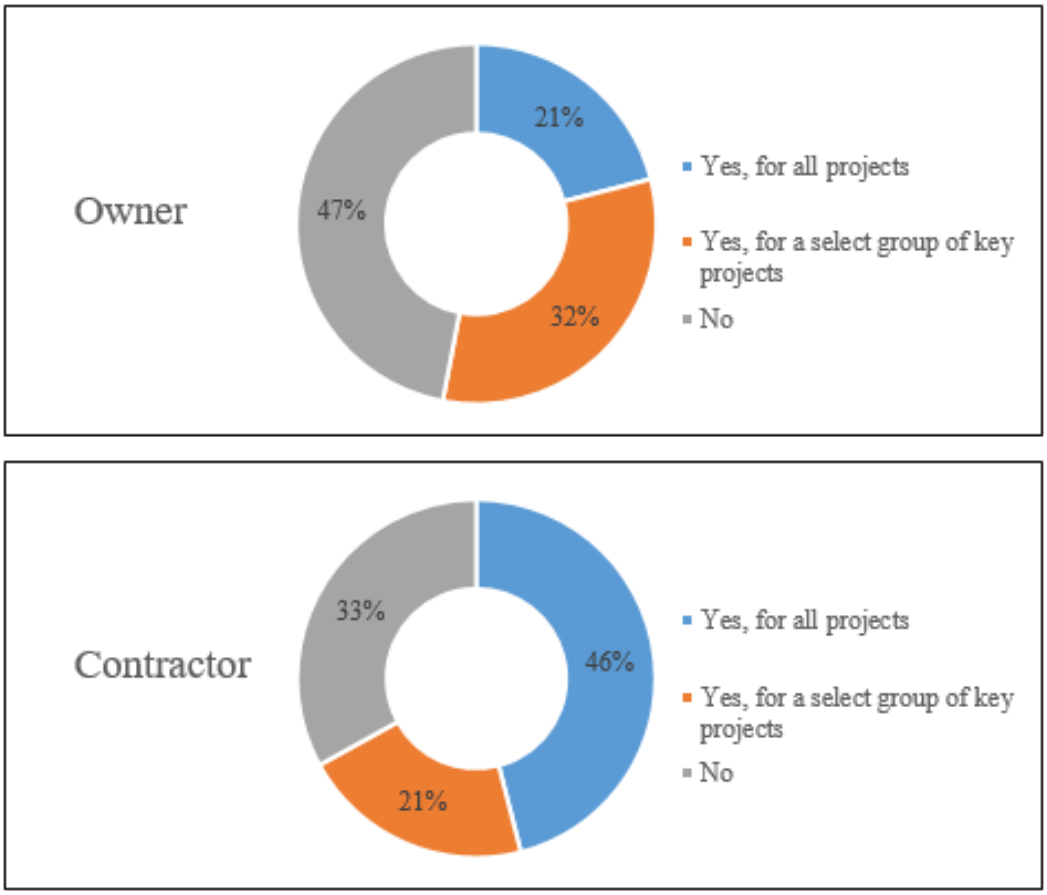

Figure 2.13. Project Management EVM Tools Utilization (KPMG Global Construction Survey, 2016).

According to the KPMG report (2016), consistent and transparent control of projects is possible thanks to a strong project management and established culture. It gives employers the confidence to maintain high standards regardless of scale or geography of a project. For example, when engineering and construction companies bid for lucrative government contracts, their chances of success increase if they can show evidence of controls that meet the prescribed standards. Controls may also notify management if the contractor is unprepared for a tender. Examples can be reproduced. Figure 2.13 indicates the results of another survey on how the engineering and construction companies evaluate the Project management processes in terms of consistency. Only 27% of the companies thinks that the project management processes are implemented globally in a highly consistent way. 25% of the respondents claimed that the PM processes vary considerably from project to project (KPMG Global Construc-

tion Survey, 2016).

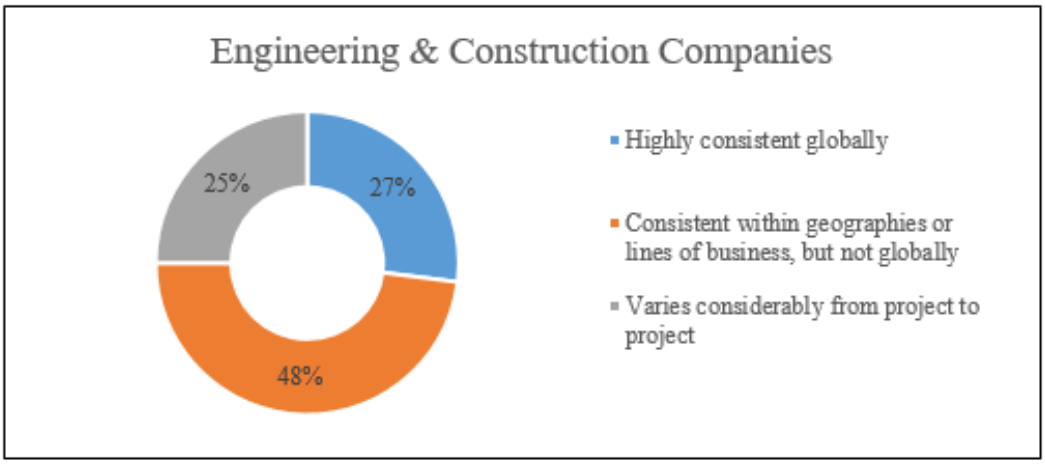

Figure 2.14. PM Processes Consistency (KPMG Global Construction Survey, 2016).

In many construction projects, employers, engineering and construction companies say they are constantly reporting key performance measures for cost, risk, security, procurement and timing. However, the biggest difference appears in the quality report. Quality flexibility is limited in most large-scale construction projects, so unreported or unknown quality problems can jeopardize future costs and timing targets. Only half of the respondents claim to report errors and omissions, and only a third say they follow turnover plans for commissioning (Figure 2.14). (KPMG Global Construction Survey, 2016).

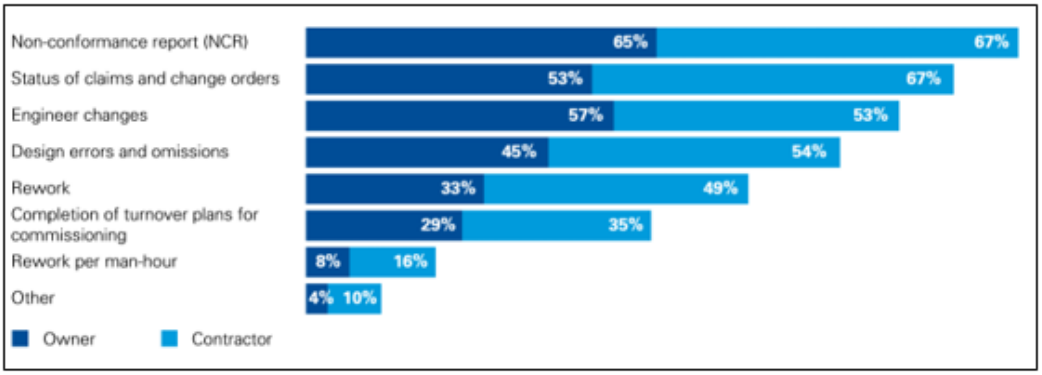

Figure 2.15. PM Quality Based Performance Matrix (KPMG Global Construction Survey, 2016).

In terms of quality, it is essential that project reporting be conducted in a comprehensive and consistent manner. Otherwise, both employers and contractors have to tackle performance issues. Only reporting of quality is not sufficient, it is also crucial to assess and evaluate the future claims and the potential cost and schedule overruns (KPMG Global Construction Survey, 2016). According to KPMG's Global Construction Survey (2019), 69% of the innovative leaders (the top 20%). have integrated construction project management systems in the construction projects that they are leading, while 33% of the followers (middle 60%). could implement the project management systems. And only 7% of the behind the curve project managers (bottom 20%). integrated the project management systems in their projects (Refer to Figure 2.16).

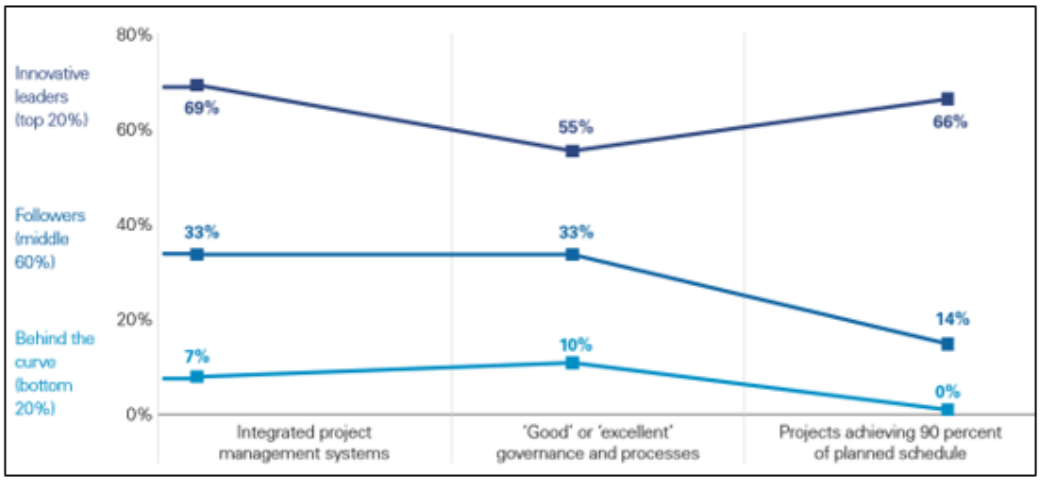

Figure 2.16. Project Management Integration Ratio in Global Construction Projects (KPMG Global Construction Survey, 2019).

2.5.3. Related Studies

Project Management methods and procedures vary widely in almost every sector and various standards have been established for project management utilization. In construction sector, the literature is rather limited for the studies evaluating construction project management practices in the world. Most of the related literature include case studies of one or several specific projects or there are many studies investigating the specific services of construction project management practices; such as cost and

time overruns, quality management, performance management, etc. The literature of construction project management standards that have been referred to in the above chapters can be considered as the main sources in this area (Project Management Body of Knowledge (PMBOK, 2014), the Construction Extension to PMBOK (2016), Construction Management of Standards of Practice (CMP), IPMA Competence Baseline (2006), PRINCE2 (2017). and (P2M, 2005)).

Since the construction project management is a constantly evolving sector and interrelated with the dynamic nature of the construction sector, the conducted studies are expired after several years. The most recent and updated information are found in the annual reports of private sector companies. The recent Allianz, Euler Hermes, KPMG, Deloitte reports include the most up-to-date information. Also, "Global Construction Success" of Charles O'Neil, 2019 and "Management of Global Construction Projects" of Dr. Edward Ochieng *et al.* (2018). are the recent books published in 2018 and 2019 related to project management in global construction sector.

2.6. Turkish Construction Market

2.6.1. General Overview

As in many other economies, the construction sector in Turkey, also has the distinction of creating the driving force of growth, also is a leading indicator of the overall economy. The acceleration and deceleration in the construction sector in Turkey is earlier than in the general economy. However, the sector is one of the most important contributors both directly and indirectly to the overall economic growth with its high growth rate, except for the recent slowdown. The construction sector tightened by 5.3 % in the third quarter of 2018 compared to the same period of 2017 and became one of the sectors that limited overall growth. The long-term trends of the Turkish construction sector indicates that the Turkish construction sector is one of the most sensitive sectors to the fluctuations in the general economy. Turkey achieved a growth ratio of more than 7% in the 2003-2007 period and the growth in the construction sector was much faster. In 2008-2009, Turkey's economy is shrinking sharply due to

the global crisis. After performing well above the general economic growth in the period of 2010-2014, the construction sector converged to the general economic performance in 2015. Even in the last quarter of 2017, it started to grow slower than the general economic growth (KPMG, 2019).

Table 2.2. Sector' Average Contributions to GDP Growth (TÜİK).

	Agriculture	**Industry**	**Construction**	**Service Provider and Trade**	**Total GDP Avg Growth for each Quarter**
2003-2007	0.1%	1.7%	0.9%	4.7%	7.3%
2008-2009	0.3%	-0.7%	-0.7%	-0.8%	-1.9%
2010-2014	0.2%	1.8%	0.9%	4.8%	7.7%
2015-2016	0.2%	0.9%	0.4%	3.1%	4.7%
2017 Q1	0.1%	1.3%	0.3%	3.5%	5.3%
2017 Q2	0.3%	1.2%	0.4%	3.4%	5.3%
2017 Q3	0.5%	2.7%	1.4%	6.9%	11.5%
2017 Q4	0.3%	1.9%	0.5%	4.7%	7.3%
2018 Q1	0.1%	1.7%	0.5%	4.9%	7.2%
2018 Q2	0.1%	0.8%	0.1%	4.5%	5.3%
2018 Q3	0.1%	0.1%	-0.4%	1.8%	1.6%

The share of the construction sector to the gross domestic product in Turkey is given in Figure 2.17 together with the construction market size between years 2009 and 2018 (TUİK). The share of the construction sector was 5,6% in 2009 and increased steadily until 2016. The share remained at the same ratio of 8,6% in 2016 and 2017 and decreased to 7,2% in 2018 first time after 9 years.

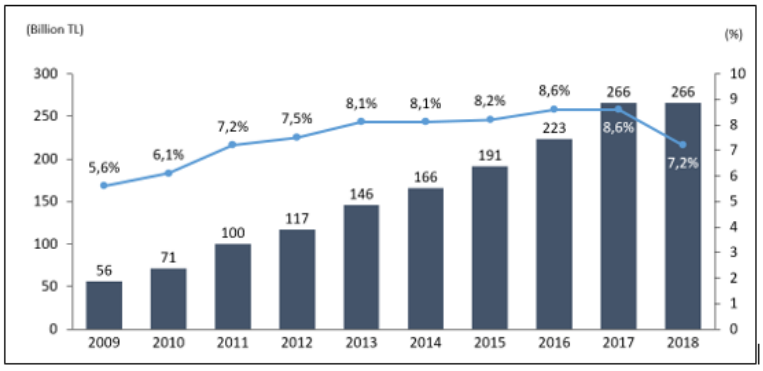

Figure 2.17. Turkish Construction Sector Market Size and Share in GDP (TÜİK).

Construction activity in Turkey is undergoing a transformation due to changing lifestyles and evolving needs. In line with the new trends in the sector in recent years, intelligent building systems, green buildings, modern living spaces, home-office systems and entertainment and activity centers have become indispensable for modern projects. While the importance of urban transformation is increasing in the housing market, non-residential commercial structures focus on social needs. Large public-funded infrastructure and transformation projects as well as overseas contracting works also have an important share in the sector's business volume. Foreign direct investments towards the sector are also increasing (Sezgin, 2018).

Residences segment in Turkish construction industry, which constitutes approximately 60% of the domestic construction sector production, is rapidly increasing; it is seen that residences construction sub-sector has become the locomotive of growth in construction activities. However, while the ratio of construction loans to GDP increased rapidly in recent years, the ratio of housing loans to GDP remained flat after 2013. As of October 2017, the ratio of loans extended to the construction sector to GDP was 5.9%, while the ratio of housing loans was 6.3% (Sezgin, 2018).

The total turnover of shopping malls, which have a significant share in commercial real estate, is estimated to reach TL 110 billion by the end of 2018. In the coming period, it is expected that new projects in big cities will continue as well as investments in Anatolian cities with a high market potential. Nevertheless, investments are expected to move at a slower pace than in previous years due to the saturation of the market, increased competition and shrinking profit margin especially in big cities (Sezgin, 2018).

In addition to private sector investments, infrastructure projects of the public sector are also effective in the rapid growth of the construction sector in recent years. Some of the prominent projects in Istanbul, which are referred to as mega projects due to their large investment scales, are the 3rd Airport, Kanal Istanbul and Istanbul Finance Center. These projects create a gravitational area in the region where they are located, thus making construction activities focus on these regions. Public-private

cooperative financing models are mainly used in mega-projects with large budgets (Sezgin, 2018).

In addition to domestic activities, Turkish construction companies are active abroad. The total value of 9375 projects undertaken by Turkish contracting firms in 120 countries from 1972 to the end of June 2018 was US $ 367 billion (Dalkılıç, 2018).

Construction activities are not only limited to the residences segment, but also grow in areas requiring more technical and expertise (such as dams, power plants, bridges, tunnels). over the years. In the more technically challenging infrastructure investments, Turkish companies have successfully completed many overseas projects (Dalkılıç, 2018).

International Construction Sector Magazine ENR has published the World's Top 250 International Contractors list in the previous year, based on the revenue generated by contractors from their activities abroad. While the number of Turkish contracting companies was 40 in 2015, this number increased to 46 in 2017. Thus Turkey, in 65 companies, ranks first after China and achieved second place in the world. USA is in the third place with 43 companies. The market size of the 250 largest firms in the international construction sector, which is one of the sectors most affected by global economic uncertainty, contracted by 6.4 % last year to $ 468 billion (Dalkılıç, 2018).

Table 2.3. Overseas Contracting Services and Project Distribution (Ministry of Commerce, 2018).

	2015	**2016**	**2017**	**2018-September**
No of Projects	265	191	275	96
No of Countries	57	56	52	30
Project Budget	23175	13817	14858	10586
Avg. Project Budget (Million USD)	87	73	54	110

2.6.2. Role of Project Management in Turkish Construction Sector

The construction management practices commenced in 1960's and 1970's in Turkey and the Association of Turkish Consulting Engineers and Architects (ATCEA / TMMMB). was founded in 1980. It aims to explain the importance of the concept of consultancy engineering and architecture to the related institutions and society, to work on the development and development of consultancy services, and to reach the highest international technological and organizational level in this field by pioneering in bringing international applications to our country. It is a non-governmental organization representing the engineers and architects providing independent consultancy services (URL-11). Project Management phenomenon in Turkey has evolved at the beginning of the 2000s with the entry of global capital and international investors. Turkish construction project management companies' contribution increased in the sector in this period. One of the main reasons for this is that it is difficult to monitor both execution and control processes in growing and multi-investing companies. Another reason is that the necessary and experienced organizational structure cannot be established with sufficient capacity in a limited time. Of course, the most important reason is that Project Management is seen as an 'Expertise' and 'Risk Management and Transfer' within the framework of the necessity to rapidly integrate global capital expectations and local capital expectations on common ground. Today, within the framework of the expansion and complexity of the scope of the projects, the areas of expertise in Design Management, Risk Management, Tender Management, Site Management and Value Engineering have developed. These specializations are an integral part of Project Management and they also have to be integrated, proactive and solution-oriented processes in Project Management. In the following period, with the entry of foreign investors to the country between 2005 and 2015, the sector developed and trained many experts especially with the use of project management companies specialized in shopping malls, hotels and office projects (URL-9). In the last 10 years, many companies have started to prefer Project Management companies in Turkey. Especially with the emergence of large-scale and mixed projects, Project Management companies have presented significant improvement due to their rapid decision-making advantages, equipped structures, and skills in analysis and process management (URL-

10).

As a result of all this, the importance and necessity of Project Management is increasing. The spread of the developing technologies of BIM and similar applications to the sector, the integration of digital technologies into the sector, gaining importance of project costs and durations will provide further development and growth of the sector. In the construction sector, project management companies that invest in the development of knowledge, expert staff and applications will come to the fore. Because, in order to realize the objectives, to detect and prevent possible problems in advance and to make the right guiding decisions; the investors need deep knowledge, skills and experience, qualified staff (URL-10). The construction project management service areas defines by the Turkish Consulting Engineers and Architects (ATCEA / TMMMB) is given in below Table 2.6.2 (URL-12).

Table 2.4. ATCEA Service Areas (ATCEA/TMMMB).

SERVICE AREAS	
Pre-project Planning Services	Project identification
	Pre-investment studies
	Feasibility studies-assessments
	Project appraisal
	Investment appraisal
Project Support Services	Architecture
	Cartography
	Computer services
	Contaminated land assessment
	Cost planning
	Earth sciences
	Environmental impact studies
	Exploration-evaluation
	Financial impact studies
	Market surveys
	Model testing
	Oceanography
	Photogrammetry
	Regional-urban-rural planning
	Remote sensing-GIS
	Resource studies
	Site evaluation
	Technical surveys
	Topography

Table 2.4. ATCEA Service Areas (ATCEA/TMMMB) (cont.).

SERVICE AREAS	
Project Preparation Services	Sketches and pre-designs
	Funding-procurement advice
	Technical appraisals
	Detailed designs
	Tender documents-bid evaluation
Construction Implementation Services	Accounting and auditing
	Construction management
	Field engineering
	Inspection
	Material testing
	Procurement services
	Product certification
	Project management
	Quality assurance
	Site supervision
Post-construction Services	Commissioning
	Enterprise management
	Operations and maintenance
	Training
Legal Support Services	Arbitration
	Contracts
	Damage evaluation
	Expert witness
	Litigation

2.6.3. Related Studies

In this section, the studies conducted regarding the construction management services in Turkish construction sector are briefly explained.

Gerger (2006) completed a master thesis named "Detection of Profiles of Construction Project Management Companies that have Operations in Turkey. In this study, he explained project planning and management and analyzed a project with Primavera on a water and sewer line. Kazaz and Ulubeyli (2009) published a journal paper about the strategic management practices in Turkish construction firms. Ata (2009) discussed the implementation of professional project management standards in Turkish construction industry in his master thesis. Oral (2010) studied in his master thesis the comparison of construction management practices in the United States and in Turkey. Dalyan (2010) studied project management and computer aided planning

in Turkish construction industry in her master thesis. Sönmez (2010) also prepared a master thesis comparing the international project management standards according to knowledge areas and phases and evaluation in Turkish construction sector.

2.7. Construction Project Management Companies Operational in Turkey

A comprehensive research has been conducted in order to establish a list of foreign and local construction project management companies operational in Turkey. The official websites such as "Association of Turkish Consulting Engineers and Architects' has been covered and sector professionals have been contacted in order to request their records. Most of the companies conduct industry analysis regularly in order to obtain the sector overview and be informed about the rival companies. Finally, a list of thirty two construction project management companies operational in Turkey has been longlisted. The companies are foreign / local based and currently operational in Turkey. All the companies have satisfactory track records in their areas of expertise.

The companies which are specialized in very specific areas are excluded from the scope of this survey. For example, there are companies claiming that they are providing construction project management services in their websites. However it can be seen from their track record that they provide real estate consultancy, green building certification consultancy, lighting consultancy, etc. services. Therefore, the specialty consultant companies are not included in the longlist.

2.8. The Profiles of the Construction Project Management Companies

In this section, the general profile of the longlisted construction project management companies operational in Turkey is explained and the information is visualized via below figures.

Figure 2.18 shows the origin distribution of the companies. Out of 32 long listed construction project management companies, 18 companies are established in Turkey and 14 companies are foreign based.

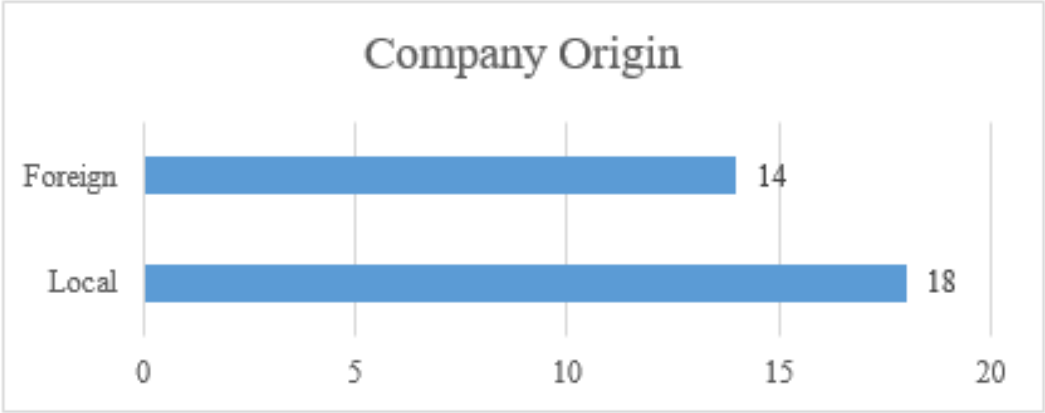

Figure 2.18. Company Origin.

Figure 2.19 indicates the distribution of establishment countries of 14 foreign based construction project management companies. According to the below figure, 4 of the 13 foreign companies are established in UK. 3 of the companies are based in USA, 2 of them are based in France. The remaining 5 companies are established in Netherlands, Germany, Lebanon, Sweden and Spain.

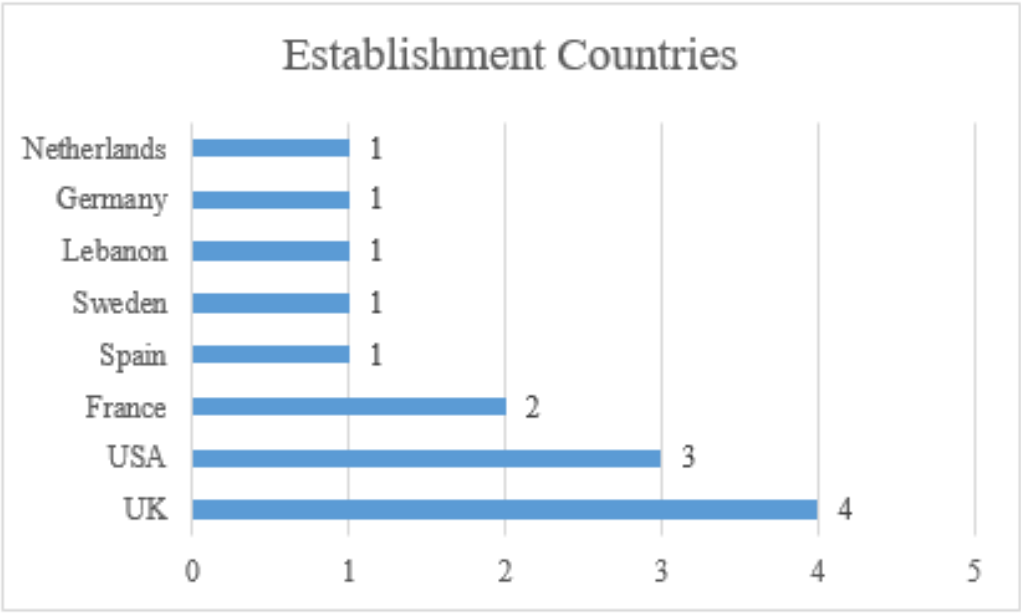

Figure 2.19. Establishment Countries of Foreign Based Companies.

Figure 2.20 presents the head office locations of the companies including the breakdown for the foreign and local companies. In terms the companies' operations

in Turkey, 22 companies have their offices only in Istanbul. 5 companies have both Istanbul and Ankara offices and 3companies have only Ankara Offices.

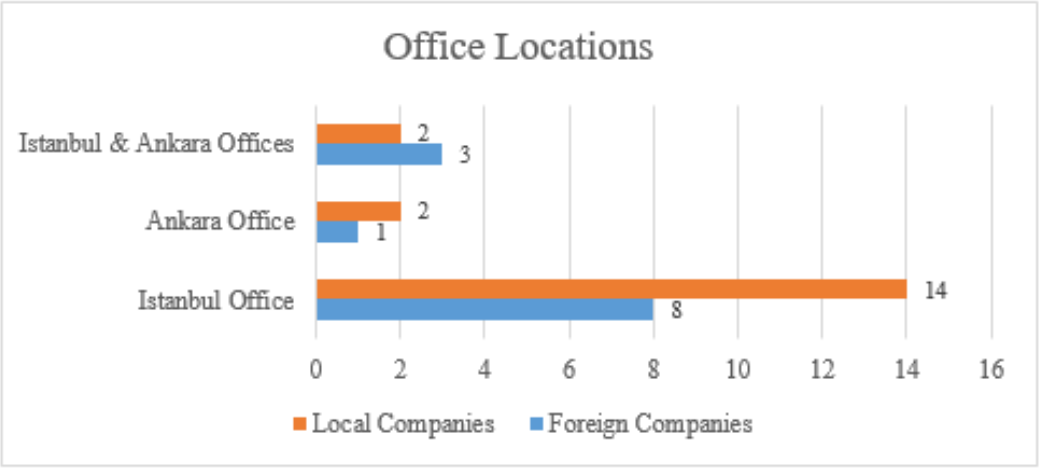

Figure 2.20. Office locations.

In terms of the establishment dates of the companies, it can be clearly seen that the foreign companies were established much earlier than the local companies. The reason can be explained by the relatively late application of the construction project management practices in Turkey. The foreign companies' commencement of operations dates in Turkey however coincide with the local companies' establishment dates. Please refer to below Figure 2.21 for the establishment dates summary.

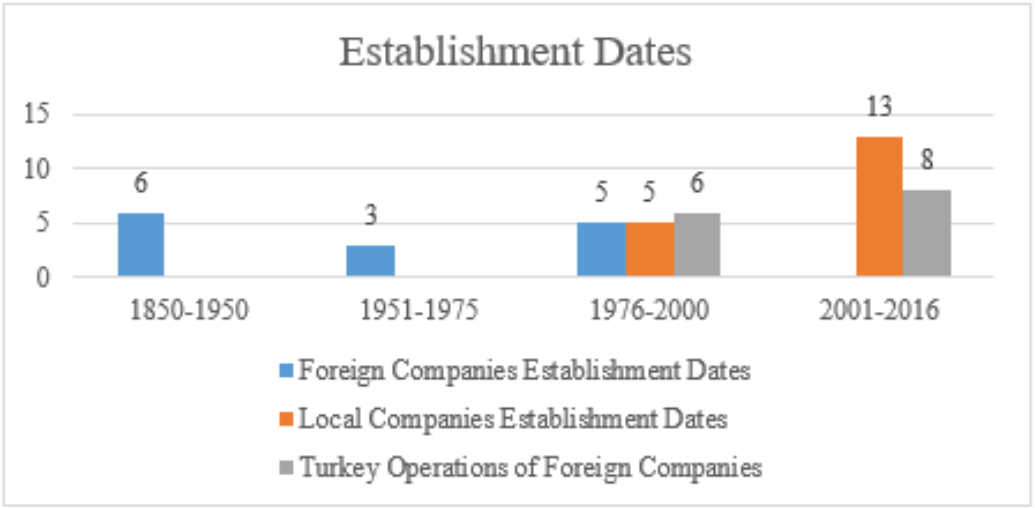

Figure 2.21. Establishment Dates Summary.

Finally, it is worth to mention that all of the local construction project management companies claim that they are capable of undertaking projects overseas and they even have overseas reference projects in their websites. When it comes to opening overseas offices, 7 of 18 companies have overseas offices, whereas 11 companies have only local offices in Istanbul, Ankara and sometimes in further Anatolian cities.

3. STRATEGIC MANAGEMENT

The academics have developed various frameworks and definitions for the concept of strategic management, because by its nature the field of strategic management stands at the intersection of numerous fields, including economics, sociology, finance, and marketing. According to Van Cauwenbergh and Cool (1982), strategic management deals with the formulation aspects (policy) and the implementation aspects (organization) of calculated behavior in new situations and is the basis for future administration when repetition of circumstances occur. As proposed by Nag, Hambrick and Chen (1990), in the field of management, strategic management involves the formulation and implementation of the major goals and initiatives taken by an organization's top management on behalf of owners, based on consideration of resources and an assessment of the internal and external environments in which the organization operates. Teece (1990) claimed that strategic management can be defined as the formulation, implementation, and evaluation of managerial actions that enhance the value of a business enterprise. Bernard Marr (2006) defines the Strategic Performance Management as the organizational approach to define, assess, implement, and continuously refine organizational strategy. It encompasses methodologies, frameworks and indicators that help organizations in the formulation of their strategy and enable employees to gain strategic insights which allow them to challenge strategic assumptions, refine strategic thinking, and inform strategic decision-making and learning. According to Ayitey (2008), strategic management is the process of specifying the organization's objectives, developing policies and plans to achieve these objectives, and allocating resources to implement the policies and plans to achieve the organization's objectives.

Porter (2000) defines three key principles underlying strategic positioning as given below;

- Creating a unique and valuable position,
- Making trade-offs in competing (choosing what not to do).
- Creating "fit" among a company's activities to support the chosen strategy.

3.1. Strategic Analysis

Bernard Marr (2006) states that the starting point for Strategic Performance Management is a shared understanding and clarification of the strategic context of the organization. This understanding can be achieved via strategic analysis by formulation of possible strategies. To be able to formulate the strategy and establishing a business model, the capabilities of an organization should be matching with the environment, which requires external and internal analysis. According to Wisdom Kwesi Ayitey (2008), effective strategies are based on analysis, weighing up probabilities and identifying sources available both within the organization and outside the organization. Strategic analysis is the first step of strategic management (Terezie Bartuskova, Ales Krestai, 2015). Figure 3.1 from "Exploring Corporate Strategy" (Gerry Johnson, Kevan Scholes, Richard Whittington, 2008) presents the layers of a business environment an organization operates. From the approach of strategic analysis, the macro-environment, the industry (or sector) and the competitors are required to be analyzed and well understood in order to formulate the strategies, which is referred to as the External Strategic Analysis. The second part of the strategic analysis the Internal Strategic Analysis, which requires looking inside the organization in order to determine its competencies and key resources (Bernard Marr, 2006).

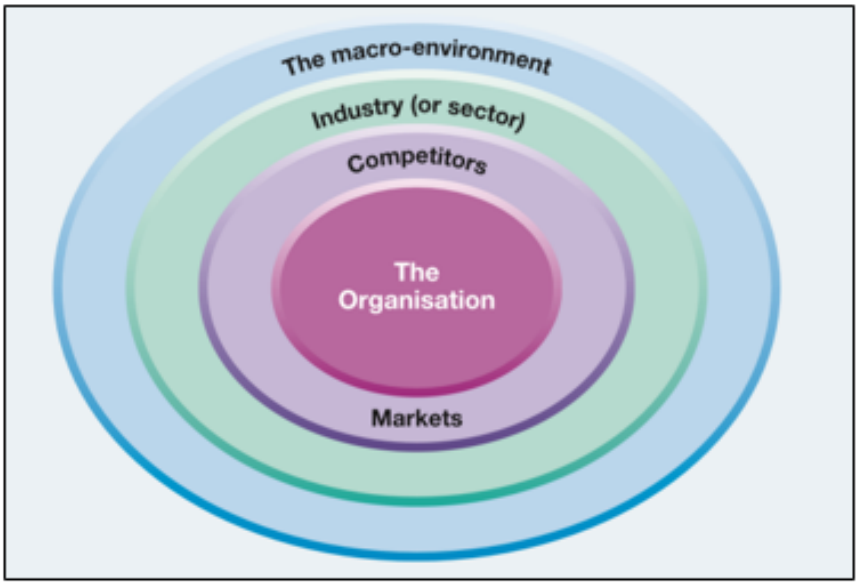

Figure 3.1. Layers of the Business Environment (Exploring Corporate Strategy, 2008).

3.1.1. External Strategic Analysis

According to James Moore (1993), a company can be viewed not as a member of a single industry but as part of a business ecosystem that crosses a variety of industries. In a business ecosystem, companies co-evolve capabilities around a new innovation: they work co-operatively and competitively to support new products, satisfy customer needs, and eventually incorporate the next round of innovations. So, in order to manage in this environment, the organizations should determine how to position themselves within this business ecosystem. As Terezie Bartuskovaa and Ales KrestaStrategic (2015) say, strategic analysis of the external environment deals with identification and investigation of factors which effect an organization from outside and influence its actions and strategic position on the market. This action has both positive character (because it brings new opportunities to the organization) and negative character when these factors may significantly risk the organization's activities. We can say that external analysis is the general term for opportunities and threats identification, which has impact on the company.

Figure 3.1 indicates three layers of the business environment, which require distinctive frameworks for the analysis;

- The macro-environment consists of broad environmental factors that affect all the organizations. The PESTEL frameworks is deployed to identify how the future trends in political, economic, social, technological, environmental and legal environments might affect the organizations (Gerry Johnson, Kevan Scholes, Richard Whittington, 2008)
- The layer of industry (or sector) represents a group of organizations producing the same products or services. For this layer, Porter's five forces framework is utilized in order to analyze the five major factors of buyers, suppliers, potential new entrants, substitutes and competitors that shape the competitive environment of every sector (Bernard Marr, 2006)
- The competitors and markets layer shows that that are many different organizations with different characteristics and competing on different bases in most

of the industries. Strategic group concept is used for this layer, which groups organizations within an industry that have similar business models or similar combinations of strategies.

3.1.1.1. Pestel Analysis Factors (Macro Environment Analysis). The academics have tried to enhance the value of the SWOT approach, supporting the idea that a SWOT analysis should thoroughly analyze the internal and the external environments. The earliest known framework was proposed by Francis J. Aguilar (1967) as ETPS standing for Economic, Technical, Political, and Social. In 1982, Weihrich suggested the political, economic, social and technical (PEST) factors framework in order to support the identification of the SWOT factors. Many variations are developed including additional factors to the initial framework such as environmental, legal, labor related, international, and demographic, etc. It is advised to choose the acronym that suits most to the organization and objectives (Nitank Rastogi, Trivedi, 2016) In this study, it has been proceeded with the PESTEL framework in accordance with the terminologies in Strategic Performance Management, 2006 and Exploring Corporate Strategy, 2009, which also suits most to the construction project management companies. As stated above, the organizations use the PESTEL framework to analyze the macro-environmental factors. The results of the PESTEL analysis are used to identify threats and weaknesses which can be employed further in the SWOT analysis.

The six categories of the PESTEL Framework are given below;

- Political: stands for the influence of governments,
- Economic: states the macro-economic factors such as exchange rates, business cycles and differential economic growth rates around the world,
- Social: include income distribution and population demographics,
- Technological: refers to innovation, new discoveries, etc.,
- Environmental: embraces the issues, such as pollution and waste,
- Legal: describes the legislations, regulations, employment lows, health and safety, etc.

3.1.1.2. Porter's Five Forces (Micro Environment Analysis). PESTEL framework in the previous section indicated an analysis on how the political, economic, social, technological, environmental and legal forces in the macro environment might affect the success and/or failure of an organization. However, there is another major approach in order to analyze the strategic micro environment regarding how the organizations relate to their industry or sector. This approach is named Porter's Five Forces Framework, which was developed by Michael Porter in the late 1970s and early 1980s. Michael Porter explains his framework as a model for industry analysis, when examining the organizations' competitive environment (Bernard Marr, Strategic Performance Management, 2006, Hakyeon Lee, 2011)

A brief description for the five forces is given below (Exploring Corporate Strategy, 2009);

- The threat of entry into an industry: The threat of new entrants into an industry is determined by the entry barriers, which may be the economies of scale, brand loyalty, cost advantages, customer switch costs, initial capital requirement, government regulation, etc. The idea is that the lower the entry barriers are, the higher is the effect of this competitive force and via versa.
- The threat of substitutes to the industry's products or services: A client's requirement can be provided by different providers of different industries. It is claimed that this competitive force is higher when the number and closeness of substitutes are high in an industry.
- The power of buyers of the industry's products or services: Buyers / Clients can dominate an industry by negotiating the prices down or increasing the costs by excess demands. Therefore the powerful the buyers are, the higher is the effect threat in the industry.
- The power of suppliers into the industry: Similar to the above item, the suppliers can also dominate the industry by raising the prices or reducing the quality of products or services. The competition is high if the suppliers are powerful. The suppliers are powerful when products / services are unique, supplier switching cost is high, etc.

- The extent of rivalry between existing competitors in the industry: The high degree of rivalry between the existing companies creates a major threat for the new entrants in terms of profitability.

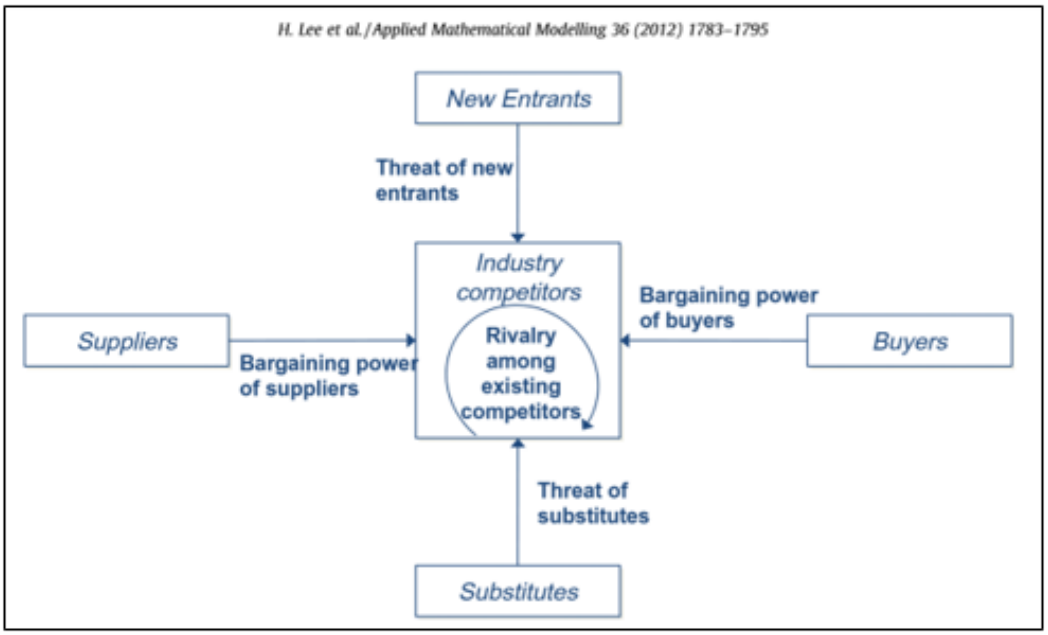

Figure 3.2. Porter's Five Forces Model (Marr, 2011).

3.1.1.3. Strategic Group. After having reviewed the macro factors affecting all the organizations via PESTEL analysis and the factors specific to the competition within the industry via Five Forces Framework, there is a third major approach for external analysis, which defines the factors specific to the competitors, called strategic group concept (Gerry Johnson, 2009).

The strategic group concept was first introduced by Hunt (1972), in order to clarify why the performances of the organizations with different strategies differ from each other. The concept has been used and adopted by many researchers since then. Porter (1980) claimed that a strategic group is a group of firms in an industry following the same or similar strategy along a set of strategic dimensions. According to Porter, strategic group analysis is the first step of industry analysis in order to understand the strategies of all main competitors (Dikmen, 2009).

3.1.2. Internal Strategic Analysis

The internal component of the strategic analysis requires looking inside the organization in order to evaluate and determine the competencies and key resources of the organizations (Bernard Marr, 2006). In comparison to external strategic analysis, the internal strategic analysis is relatively new in construction industry. The internal analysis frameworks were being established since the late nineteenth century. However, researches in this field has been evolving on a continuous basis in the last two decades.

According to Kazaz and Ulubeyli (2009), internal strategic analysis aims to specify the future targets of an organization and prepare long-term plans based on systematic frameworks, such as resources based view.

3.1.2.1. Resource Based View. The resource-based approach is originated from Selznick's (1957) study on distinctive competences and also from Penrose's (1959) discussion that a firm is a collection of resources and its performance depends on its ability to use them (Ambrosini, 2003). Several classifications of firm's resources have been developed by literature (Barney, 1997) and generally they build on the distinction between tangible and intangible resources. As Gerry Johnson, Kevan Scholes, Richard Whittington state in Exploring Corporate Strategy (2009), an organization may achieve competitive advantage among the other organizations due to its internal strategic capabilities and because of the fact that the other organizations may have difficulties in obtaining these capabilities. These capabilities can be the resources the organization utilizes and/or they can also be the way these resources are deployed, which can be called as the organization's competences.

So the concept of resource-based view can be defined as the competitive advantage and superior performance of an organization by the distinctiveness of its capabilities. The breakdown of the organizational resources are given below under the two main categories of tangible and intangible resources;

- Tangible resources: are the physical assets of an organization such as plant, people and finance.
  (i) Physical resources are the machines, equipment, buildings, property, plant, location of building, information and communication infrastructure, natural resources, physical infrastructure, office design, the production capacity of the organization, etc.
  (ii) Monetary resources are the capital, cash, investments, bonds, loans, debtors and creditors, and suppliers of money (shareholders, bankers, etc.).

- Intangible resources are non-physical assets such as information, reputation and knowledge.
  (i) Human resources are the education, technical knowledge and expertise, skills, know-how, attitude, experience, motivation, flexibility, commitment, creativity, etc.
  (ii) Relational resources are the customer and supplier relationships, reputation, image, trust, informal relationships, contractual relationships, alliances, relationships with regulators, partners, etc.
  (iii) Structural resources are the processes, tacit routines, organizational structure, governance and management approaches, organizational culture, social capital, shared identity, patents, brand names, copyrights, trade secrets, codified information and knowledge, etc.

3.2. Strategic Planning

The companies outline their mission and future trends, short-term and long-term performance objectives by stating regularly their strategic plans. The strategic plans should be outlined to be flexible in order to fit the daily economic and political conjuncture. In the strategic management processes, the companies regularly analyze the internal and external business environment by obtaining feedbacks from their strategic planning so that they can be able to accomplish the political uncertainties and economical fluctuations. In the light of the information above, the strategic planning is a very crucial tool for the construction sector, where there are many rapid and unpredictable

factors and dynamics (Kazaz and Ulubeyli, 2009).

According to Jonhnson (Exploring Corporate Strategy, 2009). strategic planning may be applied by systematized, well-ordered and chorological steps in order to create a company's strategy. Through the strategic planning process, the following steps can be followed;

- Initial guidelines: In order to commence the strategic planning process, the external environment should be analyzed and the assumptions, guidelines, priorities and market expectations should be set (external analysis).
- Business-level planning: Each business line in the company then drafts their own strategic plan to present in the corporate level of the company. The initial plans are discussed with business line managers and revised for the corporate level discussions (internal analysis).
- Corporate-level planning: The corporate level plans are created by the development and combination of the business level plans by the senior management of the company.
- Financial and strategic targets: The performance of the corporate level plans should be measured and monitored regularly. Therefore, financial and strategic targets are extracted and formulized for the performance monitoring purposes.

3.3. Strategy Formulation

The strategic management process begins with the strategic analysis, where the companies perform market based and resource based analysis for their organizations and the sector they operate. Based on their findings, the strategic plans are outlined in corporate level. Finally, the strategic choices are set which is to do with the formulation of possible courses of action, their evaluation and the choice between them and then strategy implementation proceeds, which is concerned with both planning how the strategy can be put into effect, and managing the changes required. (Johnson and Scholes', 1999).

According to Zavadkas (2011), the strategy formulation can be improved significantly by applying strategy planning tools, by widening dimensions that describe the types of entrepreneur and by integrating them into a particular system. A company's success depends on selecting the strategy successfully. The SWOT (Strengths, Weaknesses, Opportunities and Threats) analysis as an instrument for forming management strategies. The SWOT concept is described in below section in details.

3.3.1. SWOT Analysis

SWOT Analysis is defined as a methodology, which enables the companies to be aware of and utilize their strengths and weaknesses, to perceive their opportunities and to be protected against their threats. Pearce states that it is commonly accepted that an enterprise's strengths and weaknesses demonstrate the enterprise's internal characteristics and are controllable; and that an enterprise's opportunities and threats are determined by external factors on which the enterprise has no direct control but can react to its own advantage (Pearce, 1992). SWOT analysis is an important tool used for strategic planning in organizations allowing them to formulate their business strategy. SWOT analysis has internal and external dimensions as shown in below Figure 3.3. Internal dimension includes organizational factors, namely strengths and weaknesses and external dimension includes environmental factors, namely opportunities and threats.

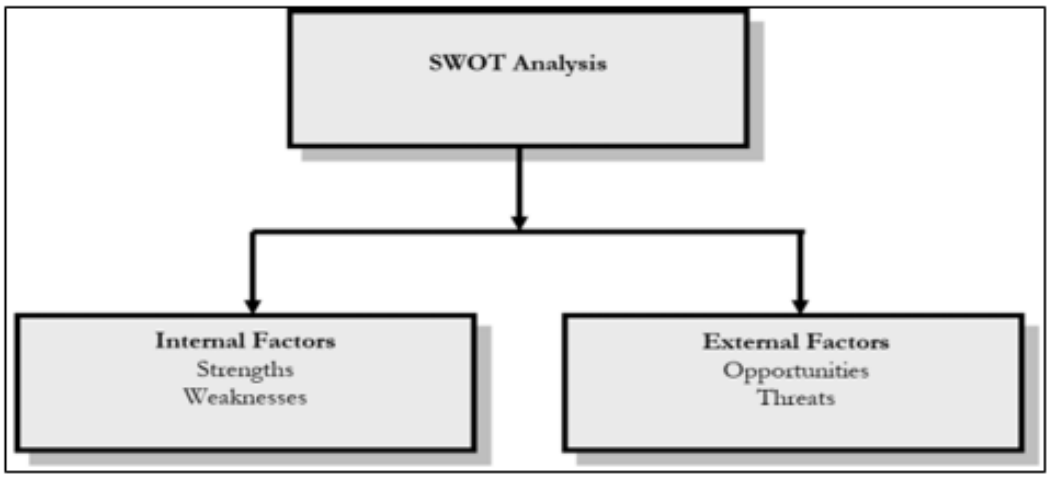

Figure 3.3. SWOT Dimensions (Gürel, 2016).

SWOT Table is organized under four titles of strength, weakness, opportunity and threat and creates a four-quadrant chart that represents an overview of internal and external factors. Figure 5.7 indicates the method of discussing all the interactions of every OS, OW, TS and TW pairs. For example in the OS quadrant, it is discussed if an opportunity is achieved by means of a strength that greatly matches that opportunity or a strength is utilized in order to take advantage of that opportunity. In the OW quadrant, it is examined if a weakness is overcome by using an opportunity or if a weakness disables taking advantage of an opportunity. In the TS quadrant, a strength may be used to avoid a threat or a strength is eliminated because of a threat. In the TW quadrant, a weakness may worsen the consequences of a threat or a threat becomes more critical for a company when having a specific weakness. Sometimes in all quadrants, the corresponding internal factor and external factor do not match, do not interact and do not have any impact on each other. Finally, the SWOT strategies are developed based on the SWOT tables' evaluations.

	STRENGTHS	**WEAKNESSES**
OPPORTUNITIES	**Opportunity-Strength Strategies (OS)** Use strengths to take advantage of opportunities	**Opportunity-Weakness Strategies (OW)** Overcome weaknesses by taking advantage of opportunities
THREATS	**Threat-Strength Strategies (TS)** Use strengths to avoid threats	**Threat-Weakness Strategies (TW)** Minimize weaknesses and avoid threats

Figure 3.4. SWOT Table Analysis (David, 2005).

4. RESEARCH METHODOLOGY

The main objective of this study is to conduct a strategic analysis for the Project Management Sector in Turkey and establish strategies accordingly. The research methodology of this study can be summarized as four main steps as given below;

- Literature has been reviewed regarding the strategy management concepts and the frameworks that have been utilized for the analysis of project management consultancy services in order to refine the proper and convenient frameworks and determine the internal and external factors to be investigated.
- Twenty two semi-structured interviews have been conducted with the sector professionals, who are actively working in the most reputable construction project management companies in Turkey. It has been aimed to investigate their perceptions for the internal and external factors affecting the construction project management sector and also take their opinions on the areas of development for the sector.
- SWOT analysis have been conducted using the acquired data for local project management companies, foreign project management companies and all companies participated in the interviews separately. Five sector professionals have been consulted while creating and evaluating the SWOT tables.
- The strategies have been formulated for local companies, foreign companies and the project management sector in general using the data acquired from the three SWOT analysis.

4.1. The Proposed Framework

It has been aimed to construct a framework in order to acquire information from sector professionals currently working in reputable construction project management companies and collect their perceptions for the determined internal and external factors, evaluate the data with the by consulting the five sector professionals and identify the strategies accordingly for the construction project management sector similar to

the strategic context framework proposed by Marr (2006).

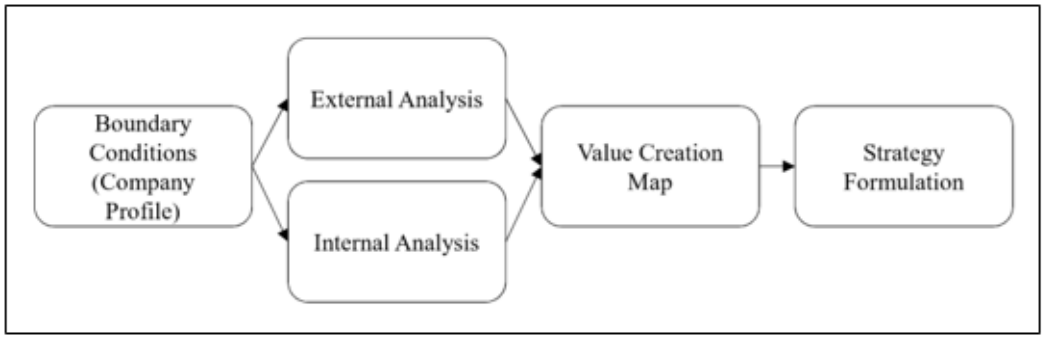

Figure 4.1. Measurement framework for strategy formulation of construction project management sector.

The proposed framework (Figure 4.1) begins with the boundary conditions corresponding to the company profile comprising the information such as the origin of the company, the years of experience in Turkish construction sector, approximate headcount and the services provided by the company. According to Marr (2006), the boundary conditions are very crucial when establishing the company's forward strategy. The main components of the proposed framework is the external and internal analysis at the company level. For the external analysis, the factors have been adopted from the PESTEL analysis, Porter's Five Forces analysis and Strategic Group Analysis. The concepts have been explained in details in Section 3.1.1. The method of how the factors have been adopted from the literature to the construction sector and eventually formulized for this study have been explained in the Section 4.2. The results of external and internal analysis allow us to create a value creation map. Marr (2006) describes the value creation map as a visual representation of the organizational strategy which comprises the most crucial components of a strategy and establishes the relationships between them. In this study, SWOT analysis has been used for the visualization of the internal and external analysis as the value creation map. The results of the SWOT analysis allow us to formulate the business strategies. The strategies are established for the local companies, international companies and for the construction project management sector in general separately at the end of this study. The experience and knowledge gained from this study can be utilized in the future studies and the pro-

posed framework can be studied in the future including the changing external factors and internal capabilities.

4.2. Semi-Structured Interview Research

Blaxter (2001) defines the semi-structured interview research as the exploratory personal investigation which involves original field interviews on a limited scale with interested parties and individuals with a view to secure greater insight into the practical aspects of the problem using interview which allows open-ended responses would lead to the comprehensive study of individual cases. The semi-structured interview research is conducted conversationally with one respondent at a time, includes a both closed- and open-ended questions, often accompanied by follow-up why or how questions. The dialogue can move around the topics of the agenda and may discuss totally unforeseen issues. The interview environment is relaxed, engaging and in-person and the reasonable maximum length would be about one hour in order to minimize fatigue for both interviewer and the respondent (Newcomer et al.., 2015). According to Kallio (2016), the semi-structured interview is a popular data collection method due to its versatile and flexible nature. The rigidity of its structure can be varied depending on the study purpose and research questions. The main advantage of the semi-structured interview is enabling reciprocity between the interviewer and the participant, allowing the interviewer to improve follow-up questions based on the participant's responses and hence receiving the participant's further opinions. The questions of the semi-structured interview are determined before the interview and set as the interview agenda. The interview agenda covers the main topics of the study but it should not be followed strictly. Instead, the objective is to extend the research area by collecting similar types of information from each participant by giving the participants the guidance on what to talk about.

After finalizing the content of the interview, a pilot study was carried out to make sure the clarity and relevance of the content. The interview was sent to few engineers who have work experience in construction project management companies in Turkey to find out their comments and understanding for the interview. According

to their feedback, revisions are done on expression of factors with simple and easily understandable words. Some factors are also revised by adding descriptive details. A comprehensive research has been conducted in order to establish a list of foreign and local construction project management companies operational in Turkey, as previously described in Section 2.4 and a list of thirty two construction project management companies operational in Turkey have been longlisted. One or multiple employees of the 32 companies have been contacted to arrange face to face interviews. The targeted interviewees are civil engineers, architects, electrical and mechanical managers with manager and / or higher level titles. The interviewees have been contacted via LinkedIn, business emails and GSM numbers if available, with the reference of mutual acquaintances. In some cases, the interviewees gave some contacts working in the longlisted PM companies during his/her interview. Since the interview survey required face-to-face discussions, the reference of mutual acquaintances was the only working method to convince the targeted interviewees.

As a result, 22 face-to-face interviews have been conducted out of 32 longlisted companies, which resulted in approximately 69% response rate. The sample interview form can be followed from Appendix A of this study.

4.3. Administration and Content of the Interview

At the beginning of the interviews, the interviewees have been briefly informed about the purpose of the survey, which have been also declared to them in the emails, LinkedIn messages and phone calls in the first place while they have been contacted. The interviewees have been ensured about the privacy of the collected data.

The first part of the interview has been designed to collect general information about the interviewe's title, profession, experience as well as his/her company's origin, years of experience, approximate headcount and the provided services. The main objective of the first part of the interview is to generate the company profile together with the interviewee's profile to be utilized in the statistical analysis. Also, the results have been evaluated according to the local and foreign companies separately using the

data collected from the first part. The first part of the interview collected the responses to below questions;

- The title of the interviewee,
- The profession of the interviewee,
- The interviewee's years of experience in construction sector,
- The origin of the company,
- The company's years of experience in Turkey,
- Approximate headcount of the company,
- The Project Management knowledge areas provided as services in Turkey.

In the second part of the interview, the interviewees were asked to differentiate the external factors according to their positive and negative impacts to their companies' success and state the importance of the factors based on a 1-5 point Likert scale 1 having the least and 5 having the highest effect on their companies' success. The objective on evaluating the external factors in this Section is collecting the interviewees' experience and perception for the external factors in the current conditions of the Turkish construction project management industry and determine which of these factors are being considered as opportunities and which factors are being considered as threats, together with their importance weights.

In the third and final part of the interview, the interviewees were asked this time to differentiate the internal factors according to their positive and negative impacts to their companies' success and state the importance of the factors based on a 1-5 point Likert scale 1 having the least and 5 having the highest effect on their companies' success. The objective on evaluating the internal factors in this Section is collecting the interviewees' experience and perception for the internal factors in the current conditions of the Turkish construction project management industry and determine which of these factors are being considered as strength and which factors are being considered as weaknesses, together with their importance weights.

All of the external and internal factors discussed with the interviewees in the second and third parts of the interviews are explained in details in Section 4.4 of this study including the current situation of the factors in Turkey and how these factors are evaluated by the interviewees.

4.3.1. Implementation of the Internal and External Factors in the Interview

In this Section of the study, the external and internal factors which have been discussed with the interviewees during the interviews are given in details. The current situation in Turkey and Turkish construction sector have been explained for the external factors as well.

As a result of the extensive research for the external analysis in the literature, the external factors for the PESTEL framework have been adopted from the paper named "Pestle Technique-A Tool to Identify External Risks in Construction Projects" dated 2016 written by Nitank Rastogi and Dr. M.K Trivedi. There are 47 factors in total under political, economic, social, technological, legal and environmental categories in the paper. These factors were reduced to 23 factors during the preparation phase and the pilot study of the interview content. The factors unrelated to the construction industry were for example excluded. As the external factors adopted from Porter's Five Forces analysis, the paper of "An analytic network process approach to operationalization of five forces model" (2011). of Hakyeon Lee, Moon-Soo Kim, Yongtae Park has been utilized. Out of the 25 factors listed in the paper, 9 factors were selected during the preparation phase and the pilot study of the interview content.

For the external factors adopted from Strategic Group Analysis, the paper of "Strategic Group Analysis in the Construction Industry" (2009) of Dikmen, Talat Birgönül, Budayan was utilized. The nominal questions were adopted from this paper enabling this study to evaluate the strategic behavior of the companies. For the internal factors which have been adopted from the resource-based view, the master thesis of "Development of a Competitiveness Model for International Contracting Firms" (2014) of Kuş has been utilized.

4.3.2. Opportunities and Threats factors

Within the context of this study, the external factors discussed with the interviewees have been adopted from the reference studies in the literature as explained in the above Section.

4.3.3. The factors adopted from the PESTEL analysis

The 23 factors adopted from the PESTEL analysis are explained below together with their current situation in Turkey interviewees:

4.3.3.1. Government stability and policies. The global crisis has affected many countries and in some countries it caused government changes. Therefore even the developed countries, who direct the global economy, have altered their economic policies. The countries are implementing structurally opposed economic policies in this process (Dalkılıç, 2018)

Government policies, international credit institutions and economic decisions have a direct impact on the development of the construction sector. The choice of the authority that either making the investment decision or financing it directly affects the companies operating in this field (INTES, 2019). In Turkey, the construction sector experienced two periods of growth which are supported by the government. More precisely, one of the main reasons for the growth in the sector was government support and contribution. The government has executed formations that can affect the construction sector to a great extent with many regulations such as zoning amnesties, regulations in zoning and planning legislation, legal arrangements that extend TOKİ's activities and increase its resources, and land allocation for construction investments (İş Bankası, "İnşaat ve Gayrimenkul-I" February, 2016). On the other hand, as a result of political conflicts, Turkey experienced depreciation and high inflation in TL against the dollar and other currencies (INTES, 2019), which caused rising costs that effected the industry adversely. So it can be asserted that, current government policies and

practices are highly effective on the construction sector.

4.3.3.2. Tax policy and trade controls. Tax is one of the fundamental dynamics of the economic relations between the real sector and the public sector. In fact, it is one of the most important indicators determining the share of the state in an economy. This is because, the taxes collected by the state express how much of the real sector funds are expropriated. In this respect, it is one of the most basic policy tools that enable the state to intervene in the economy. Today, the policies are implemented to overcome the economic crises and stagnation are handled in two groups; monetary and fiscal policies. One of the instruments used in terms of fiscal policies is tax reductions. Tax reductions and increasing public expenditures are among the policies used to increase supply (Demir, 2017). A tax reduction that reduces the cost of savings, accelerating capital accumulation; production, national income and total demand can lead to an increase. In particular, a reduction in consumption taxes, such as VAT and SCT, will contribute to economic recovery by affecting consumption in a short period of time, in other words, increasing the demand level (Demircan, 2003: 105).

For the economic stagnation that started in 2018 in Turkey, many tax regulations has been made in many areas such as food, textile, agriculture, technology and so on. Accordingly, new regulations have been made in order to maintain the vitality in the construction sector. With a statue (2016/9153) issued in 2016, VAT rates on housing delivery were reduced. With this arrangement, the VAT rate of the houses which are bigger than 150 square meters has been reduced from 18% to 8%. In addition, with this decision, VAT in residential buildings that have been granted building permits as of January 1, 2017, is subject to VAT; 8% for plots up to two thousand liras; 18% for two thousand liras and above. Thus, the scope of the lands subject to 8% VAT has been expanded (URL-13). Amendments to the Law on Fees regulated 1.5%, 1.5% of the deed fees collected from 2% buyer and 2% seller and all these discounts were extended until 31-Dec-2019 (URL-14).

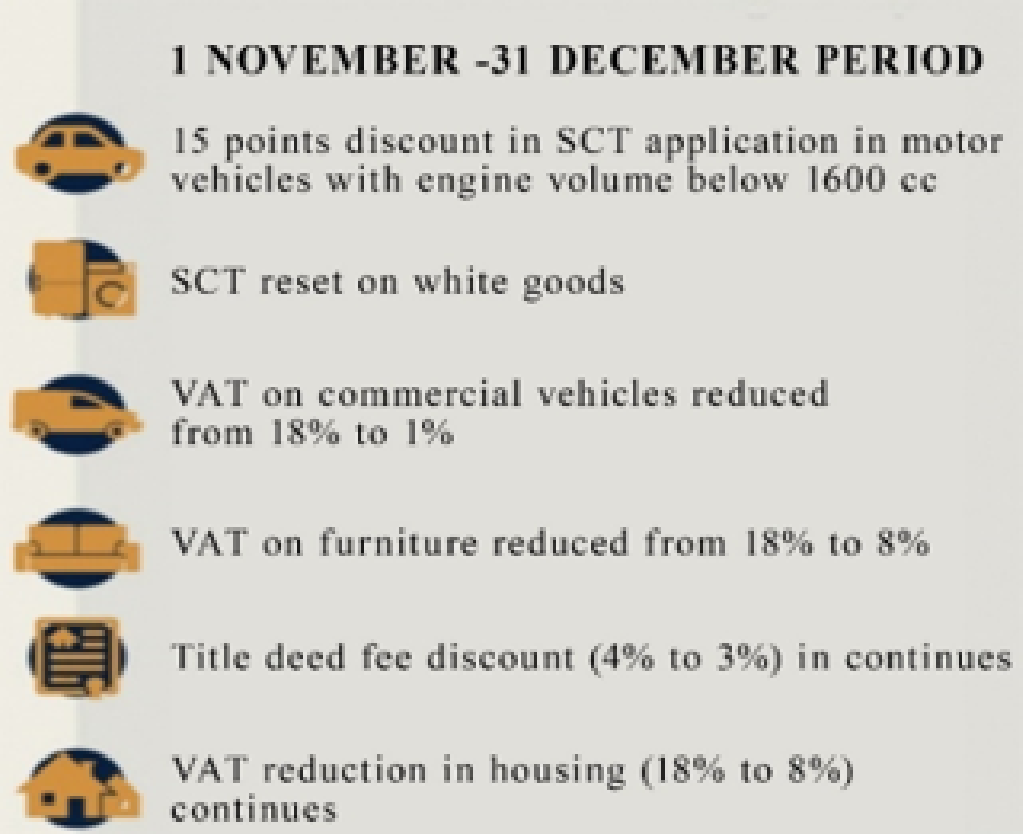

Figure 4.2. Tax reductions between 01/Nov-31/Dec 2018 (Ministry of Treasury and Finance).

4.3.3.3. Elections. Since the electoral system in a country affects the political and social life of that country to a great extent, the issue of the method to be applied is highly debated. Around the provision of the main elements of Justice in Stability and Representation, each country adopts and implements an electoral system in line with its own political conditions (Haydaroğlu *et al.*, 2016). In democratic systems; political instability can be seen due to polarization within the parliament, coalition governments, voters' indecisive attitudes, timing of elections and management of the election process and frequency of government changes. Political instability can be defined as political indetermination or changing structural conditions and is one of the important factors affecting economic performance (Şanlısoy *et al.*, 2017). Table 4.1 indicates the frequency of election periods in Turkey, which has a great economic impact on all sectors. For example, Turkey has experienced 12 elections since the beginning of 2000.

Table 4.1. Elections in Turkey.

PRESIDENTIAL ELECTION	GENERAL ELECTIONS	LOCAL ELECTION
1923	1923	1930
1927	1927	1934
1931	1931	1938
1935	1935	1942
1938	1939	1946
1939	1943	1950
1943	1946	1955
1946	1950	1963
1950	1954	1968
1954	1957	1973
1957	1961	1977
1961	1965	1984
1966	1969	1989
1973	1973	1994
1980	1977	1999
1982	1983	2004
1989	1987	2009
1993	1991	2014
2000	1995	2019
2007	1999	
2014	2002	
2018	2007	
	2011	
	2015 (June)	
	2015 (September)	
	2018	

4.3.3.4. Threats to homeland security (terrorism, etc.). Numerous definitions have been made regarding terrorism and terrorism, and each state has different definitions in its laws within the framework of international organizations. According to the Turkish Language Association (TDK), terrorism; intimidation, slaughter and destruction of goods, intimidation, has the meaning of terrorism. Terrorist acts have social, psychological, political and economic consequences in society. Some of these results are indirect and others are direct effects. The economic consequences of terrorism emerge shortly after the terrorist act and have a negative impact on the economy in the medium and long term (Algan *et al.*, 2017).

Terrorist incidents cause the regions and countries to be underdeveloped and narrow their economic, cultural and political progress. Terror limits the domestic and foreign real and legal persons to invest in the short and long term with the atmosphere of fear and chaos it creates. At the same time, the investments to be made in the region where the terrorist incidents are taking place are disrupted. While it gives fear to the public in the regions and cities where terrorism is experienced, it has a negative impact on the economy and real estate sector. As a result of terrorist incidents occurred in developing countries such as Turkey, investments and investors is shifting to other regions or even other countries (Aliefendioğlu *et al.*, 2018).

4.3.3.5. Likely changes in the economy. Several studies shows the economic and social effects of construction sector, particularly in the developing countries. 2018 has been a challenging year for the global economy, considering parameters forming the agenda of the dynamics of the global economy such as trade wars, Syria focused on geopolitical risks, the United States, Russia, China and Iran embargo that started out and Brexit process in Europe (İNTES, 2019). The effects of the fluctuations in the World Economy on the Turkish economy should be mentioned. Turkish economy, like the economies in a similar risk group, is affected by the developing trends in the world economy. In different phases of the global crisis, monetary, economic and fiscal policies and proactive interventions have to be made against the fluctuations and changes in global economies (Dalkılıç, 2018).

During the recent years, construction sector has hold a great deal of importance in economies of both national and local scale in Turkey (Mızrak, 2017). The growth of the construction sector, which is always the carrier power is also affected Turkey's economy quickly and deeply from the economic slowdown. As a result of the economic developments, the construction sector, which grew by 7.4 in 2017 and continued to grow in the first quarter of 2018 (Figure 4.3), recessed by 5.3 percent in the third quarter (İNTES, 2019). Turkey's growth rate may slow down due to the Figure 4.4. According to the RAP, 2018 growth rate is expected to be 3.8 percent annually, while it is expected to grow by 2.3 percent for 2019 and 3.5 percent for 2020. In 2021, the

growth rate is expected to reach 5% a year with the normalization again.



Figure 4.3. Construction Industry Real Growth (Tuik, İş Bankası).

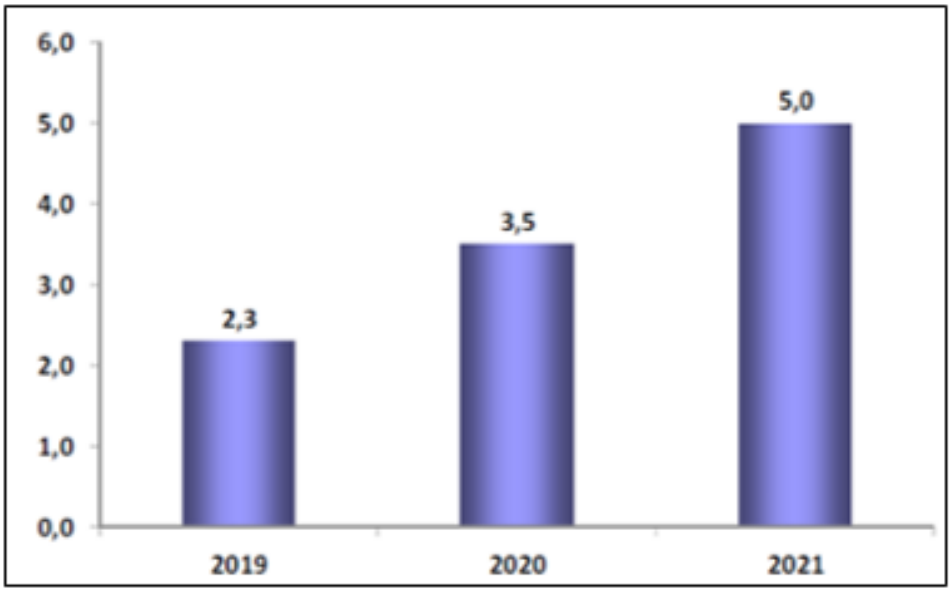

Figure 4.4. Growth Target according to Bew Economical Program (YEP). (Ministery of Treasury and Finance).

4.3.3.6. Job growth in the market and International Trends. The size of the construction sector in the world in 2013 is USD 7.2 trillion and it is estimated that this figure

will reach USD 15 trillion in 2025. Currently the share of the construction sector in the global economy is around 10-12%. By 2025, the share of the construction sector in the economy is estimated to be 16-17% in developing countries and 10% in developed countries (İş Bankası, 'İnşaat ve Gayrimenkul-I' Şubat 2016, s.1).

In developing countries, the share of the global construction sector revenue is 35% as of 2013. It is estimated that this share will exceed 60% in 2025 in the market led by China and India. In Turkey, the sector is one of the most important business lines. The projects executed in both domestic and international projects have brought the sector to an important determinant of our country's economy (Dalkılıç, 2018). Considering construction sector creates demand for goods and services produced by more than 200 sub-sectors, it effects highly of employment and production process. In this context, the contribution of other sectors which are continuing their activities in line with the developments in construction sector, the share of the construction industry in the GNP is around 30 percent (INTES, 2019).

4.3.3.7. Inflation and interest rates. The most important effect of interest rates, in addition to being an important indicator for countries, is seen on investment expenditures. Since there is an inverse relationship between interest rates and investment rates, investments increase as interest rates decrease and investments decrease when interest rates rise (Lin, 2018). Allocating housing credit institutions in Turkey, is one of the important factors affecting the housing loan market. The main focus of the activities carried out by the institutions providing housing loans is profit. In order to realize the profit target, the bank should be able to determine the loan costs and determine the loan interest rate as a result of this cost (Çakıroğlu, 2018).

Commercial loan interest rates fluctuated over the years in Turkey. Taken in this context, the development of commercial loan interest rates in Turkey was 60% in January 2002, and later showing a decrease which results at the level of commercial loan interest rates at 8%, in January 2011. The commercial loan interest rate, which gradually increased in the following period, increased to 17% at the end of 2017. In the

following period, commercial loan interest rate, which continued to increase due to the impact of national and international macroeconomic developments, increased to 34% at the end of September 2018. This level is also the highest after 2004. Commercial loan interest rates in Turkey at the end of December 2018 stood at 28.6% (Kartal, 2019).

One of the most important structural problems of developing economies is the increase in prices seen at the general level. Turkey has managed to reduce inflationary pressures rather with measures taken after 2001. Although the CBRT's annual inflation rate of 5 percent was approached from time to time in the following periods, the target was not generally achieved. In 2017, inflation was realized as 11.9 percent above the target values. As of September 2018, it increased to 25.24 percent annually. As the main reasons for the rise in inflation this year; the rise in basic food prices was driven by the cost surplus due to the increase in exchange rates and the recovery in commodity prices worldwide. As effects on construction sector, cost inflation can cause a negative impact on the industry, since the contractor has opted to make production more controlled in the face of rising costs (Dalkılıc, 2018).

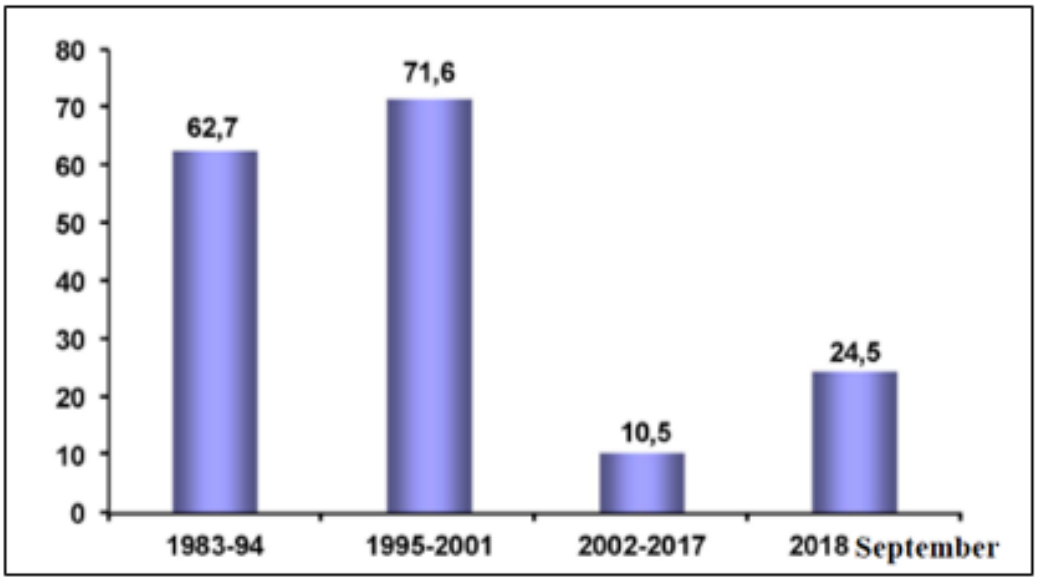

Figure 4.5. Average Inflation Rates in Turkey (TÜİK, Treasury).

4.3.3.8. Unemployment and labor supply. One of the most important problems of the economy for the whole world is increasing employment and reducing unemployment. However, according to the fluctuations in growth rates and future expectations, there may be differentiations in the level of unemployment. Since the changes in global monetary and economic policies, in particular, had an impact on the countries' growth rates, there may be consequences in terms of the employment level (Dalkılıç, 2018).

In the case of Turkey, increasing participation rate to labor force due to excessive amount of young population should be mentioned. The increase in labor force participation rate against the increase in employment limits the decrease in unemployment rates (Dalkılıç, 2018). In conclusion, according to OECD data for the fourth quarter 2018 Turkey is among the countries with the highest unemployment rate. The number of unemployed persons above the age of 15 have been 3 million 788 thousand persons in Turkey increased by 501 thousand persons in the period of October 2018, by comparison to the same period of October 2018. The unemployment rate escalated by 1.3 percentage points to 11.6. In the same period; non-agricultural unemployment rate was estimated as 13.6 with 1.3 percentage point increase (İNTES, 2019).

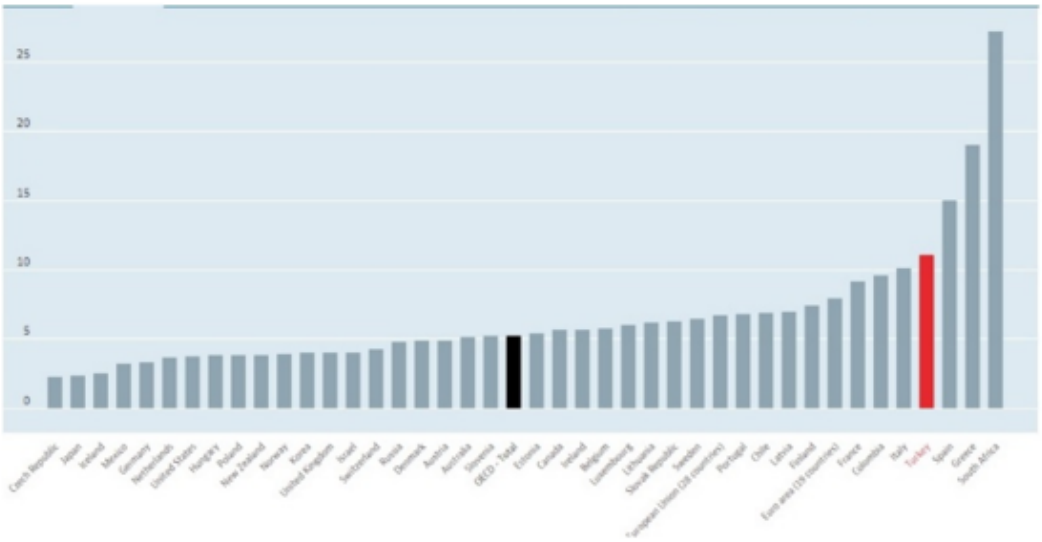

Figure 4.6. Unemployment Rates of Companies (OECD Employment Outlook).

Due to its structure, the construction sector is capable of providing employment to people of all educational levels with a broad age group. The construction sector,

which has a feature of increasing employment for both white and blue-collar workers, has created more jobs in recent years than agricultural and industrial sectors (Dalkılıç, 2018). In October 2018, 1 million 943 thousand people were employed in the construction sector and the sector's share in non-agricultural employment was 8.38%. The number of workers working in the seasonally adjusted construction sector was 1 million 903 thousand. In this period, 227 thousand persons decreased compared to the previous September (İNTES, 2019).



Figure 4.7. Unemployment in Construction Sector for 2008-2018 (TÜİK / household labor survey, TCMB).

Table 4.2. Employment Distribution in Construction Sector according to Professions for the Ages of 15-64 in 2018 (TÜİK).

OCCUPATIONAL GROUP	**Employer /1000 pp**
Executive	98
Members of Profession	54
Operatives, Technician and Assistant Members of Profession	92
Office Staff	70
Service and Sales Staff	53
Skilled Agricultural, Forestry and Water Works Employees	1
Craftsmen and Related Workers	1030
Plant and Machine Operators and Assemblers	156
Non-qualified Employees	370

4.3.3.9. Levels of Disposable Income Across Economy and Income Distribution. The data on income distribution in Turkey, Turkish Statistical Institute (TUIK) conducted by the Income and Living Conditions Survey is obtained through and announced to the public. TurkStat calculates the income distribution results according to both household disposable income and equivalent individual disposable income. In the highest 20% income tranche, the average monthly income of the individuals was 1.291 TL in 2006 and 4.261 TL in 2017. In these years, the ratio of average monthly income to minimum wages decreased from 3.69 to 3.27. The similar trend was observed in the highest income groups of the 10% and 5% income segments. The monthly average income of the highest income groups is not very high. In 2017, the highest monthly average income of 4,261 TL in the 20% tranche corresponds to the income of a middle-level manager working in the public or private sector. When the 2006-2017 data of the income distribution surveys are examined, it is seen that the income of the disposable individuals consists mainly of salary-wage-journal and transfer income. In 2006, 66.7 percent of individuals' income was composed of salary-wage-journal and transfer income. In 2017, the share of these income types increased to 73.8 percent (Yükseler, 2018).

It is understood that the results of the income distribution survey conducted by TURKSTAT are mainly dependent on the salaries and wages of the employees and pensions. In other words, it is seen that the income types that can be the source of inequality are not sufficiently weighted in the usable income which constitutes the basis of income distribution. Particularly in high income groups, concealment of income and informality leads to a distribution of income based on salaries and wages and pensions.

4.3.3.10. Health, Education and Social Mobility of the Population. The analysis of the population structure and its components is important for both investment decisions and the analysis of the economy. In the construction sector, the following features of the demographic structure come to the fore. Demographic characteristics are effective in decision-making processes of investors who invest in real estate sector. Having a young population structure is the driving force not only for consumption and investment but also for growth as a production factor. The age distribution of the population in Turkey

make up a large proportion of employment is seen as the main age group is examined (15-64 age group). The relevant age group is not only a driving force in terms of work and production, but also has a great importance in terms of consumption (İNTES, 2019).

Table 4.3. Education Level Distribution of the Employees in Construction Sector for the Ages of 15-64 in 2018 (TÜİK).

	Employer /1000 pp	**Rate**
Illiterate	32	1.66%
Literate but Uneducated	91	4.73%
Elementary School	687	35.71%
Primary School Graduate	275	14.29%
Secondary or Equivalent School Graduate	256	13.31%
High school Graduate	169	8.78%
High school or Equivalent Technical School Graduate	192	9.98%
Bachelor's degree and Graduate	222	11.54%

4.3.3.11. Consumer Attitudes. Considering the competitive conditions in the market, it becomes more and more difficult to create awareness in consumer preferences. The similarity of products and services to perform the same functions makes it obligatory for the products to be presented to the consumer at a certain value that will reflect the difference and to carry out marketing and communication activities in order to take place in the mind of the consumer with this value (Çako, 2012).

In recent years, the awareness of the consumer has been built by high quality, trusted companies, and the aesthetic value of the projects that increase the quality of life began to move towards the competitive environment in the construction sector has grown and revitalized. Thus, companies have started to give priority to the need to become a corporate brand by reviewing their structures. The corporate structure and strategies that are important for corporate brand building should form an integrity. In addition, the brand of the company should be positioned by the managers of the company for consumers (Çako, 2012).

4.3.3.12. Advertising and Media. Recently, while the construction sector has reached a maximum competitive structure, the firms have not made any managerial effort to increase their market share and continue the projects, and they have thought that the quality of the works is enough to find customers. However, technological advances have led to a change in customer demands, which has led manufacturers to focus more on cost leadership, differentiation and focus, as well as on branding due to institutionalization and marketing (Makinde, 2006).

In an increasingly competitive environment, companies have to communicate with the public in order to differentiate their products, ensure the brand's persistence and increase reliability. The companies operating in the construction sector should be preferred by distinguishing them from their competitors, gaining the trust of the consumer and creating a corporate brand perception (Çako, 2012). Investments in media communication in all sectors, have raised along with the use of printed, visual and new media. Moreover, growing construction investment, which is one of the most worthy investment tool in Turkey, as well as expansion within the sector itself, has also caused increasing media usage in the sector very significantly. Although advertising and public relations activities in the sector are generally based on print media, more institutionalized companies have started to use different preferences such as television, radio, open space, internet and social media in order to position themselves differently according to the size, detail or target audience of the projects. Social networking sites have become new alternative channels for companies that want to use different communication methods (Çako, 2012).

4.3.3.13. National and Regional Culture. In developed countries, after 1990 and today construction project management has become indispensable. However, developments in the field of construction management in Turkey had been different and slower from construction management development of the world. The most important developments in this field started after the 1980s, especially in the 1990s. In many universities, civil engineering undergraduate programs started to open courses related to construction management, even if they are inadequate. The most important developments were the

opening of graduate programs in the field of construction management. However, all these developments remained so, as a result of this situation, the construction project management discipline (culture). has not been established in our construction sector even today and it has remained at the level of project management planning (Kuruoğlu, 2016). The latest situation in our country is to bring the construction (project) management service and application standards study to our country as a result of the studies carried out with the union (CMAA), which sets the standards in the USA for construction project management.

4.3.3.14. Impact of New Technologies. With the transition period to the information society in the 20th century, not only the lives of people; architectural, economic, political, cultural, scientific and ideological processes. The basic parameter of the evolution that everyday life has gone through in thousands of years can be expressed under the title of technology. With the development of technology, new information has a direct impact on daily life and progress is realized over time (Tozlu, 2017).

The development of technology, the realization of new inventions in the field of production, the innovations in energy resources and usage, have initiated a process of rapid social, economic and technological change in mechanized production. Over time, as a result of the developments in metallurgy, steel production was started in the first blast furnaces, the discovery of new chemicals and large scale production were realized and great improvements were achieved in the cement industry and concrete technology. Building materials and dimensions are diversified and technology is developed (Yurttaş, 2009). For product development and construction of buildings it is important to adopt innovation in construction technology. Today, with the development of technology, new materials, construction technologies, carrier systems, developments in the field of building physics, ecological and sustainable design approaches have emerged and continue to emerge resulting enabling speed, robustness, health and many other advantages in construction sector (Tozlu, 2017).

4.3.3.15. Internet and New Software. The transition period to the information society in the 20th century has provided an environment for the development of computer technologies and a wide range of usage has emerged with computerized operating systems. With the development of computer, design, modeling and analysis methods and new concepts, contents and formations in architecture have emerged. These developments have resulted in the prominence of technology both in the design stage and in the execution process in the field of architecture (Tozlu, 2017). Since the 1950s, significant changes in the field of construction, computer-aided virtual reality applications and CAD / CAM applications have enabled buildings to become high-tech products and brought about a new structure that will change the world. The end of the 80's and the early 90's were the periods when CAD systems were widely used as a presentation tool (Atılgan, 2006). By the 2000s, a period which was defined as the digital age in all branches of science began. In addition to all these developments related to drawing and modeling, various design software and abstract relational data were entered into the system and the modeling work was done by computers, so that parametric designs and productive systems emerged (Tozlu, 2017).

The design of the design process through computer-based technologies provides architects with a computational environment in which a multitude of disciplines are tested in a multitude of alternatives, new techniques and production forms that respond to previously made decisions, and a final product (Orhun, 2014). Nowadays, with the developing technology, construction methods and design tools, new software has started to take the role of architect-engineer by specializing gradually. Information and communication technologies, along with their own evolutionary processes, have contributed to the emergence of different usage environments in the field of architecture and architectural design education. This evolutionary process evolves from product representation and communication, which can be modeled in a computer environment, to the processing of data and information, and to support creativity and decision-making, an activity specific to human mental processes. With these developments, the focus of architecture is directed not only to the design product, but also towards the design process and production (Çağdaş, 2015).

4.3.3.16. Local Environmental Issues. Despite all the environmental problems caused by the construction sector, its environmental, economic and social roles have made it inevitable and led to new ideas in terms of development in harmony with nature. These ideas, gathered under the concept of sustainable construction, mainly aim to reduce the resource use burden in the sector by using reusable and less energy consuming construction materials and to produce less waste as a result (Pamuk, 2016).

Parallel to the understanding of the importance of environmental performance, various professional organizations and national research organizations operating in the Turkish construction sector also encouraged contractor firms to improve their environmental performance. From the perspective of Turkish contractors, it is stated that environmental performance is brought to the agenda through projects carried out abroad rather than at home projects, and the awareness and opinions of the sector employees about environmentally sensitive construction have changed positively over time starting from the personnel working in such projects. On the other hand, interest in green building certification systems aimed at measuring the environmental performance of institutional and commercial buildings and residences has increased in recent years, and the contractors involved in the projects where such certificates are targeted are transferring their experience in sustainable construction to their subsequent projects (İlter, 2017).

4.3.3.17. Local Waste Disposal and Material Transfer Procedures. Waste management involves; prevention of waste production at the source, reduction of wastes in unavoidable situations, ensuring the usability of the same source, collection, separation according to type, temporary collection, transportation of these collected wastes to related places, recycling and reuse, recycling, disposal, It includes audit activities after the destruction process (Fırat, 2015). While the construction sector contributes 9.8% to the economy of the European Union, construction and demolition wastes harm the economy and the environment. Construction and demolition wastes occupy a larger volume than household wastes. After World War II, activities related to construction and demolition wastes started and accelerated with the globalization process. Almost

all European countries, especially the Netherlands and Germany, are based on the regulations of the Waste Management Authority concerning recycling and include methods and regulations involving technological and environmental factors (Altındağ, 2011).

In Turkey, the Regulation on Control of Excavation Soil, Construction and Demolition Wastes has been published in the Official Gazette dated 18 March 2004 and numbered 406 in order to prevent the accumulation or random disposal of construction wastes in harm to the natural environment and to ensure the recycling of these materials (Fırat, 2015). Waste management has changed positively with the involvement of Istanbul Environmental Management Industry and Trade Inc (İSTAÇ). and the implementation of "Excavation Soil, Construction Demolition Waste Transport and Acceptance Certificate". Due to the transport and acceptance document containing the information of the waste producer, the carrier and the warehouse, the monitoring of the waste has been facilitated (Maçin, 2018). Turkey has made several attempts within the framework of waste management in the framework of EU harmonization process, implementation and enforcement will continue in parallel with the evolving world order in this regard. Accordingly, in the construction applications, which have a large share in waste management, in the waste management processes, it is necessary to act in accordance with the regulations, and many applications are foreseen to be brought in the future. The material and labor resources required by employers and contractors shall be provided within this scope.

4.3.3.18. Local Legislations. Development plan is undoubtedly one of the primary and most effective factors for a healthy urban planning. Development plans; are defined as the approved document showing the use of land pieces and the main types of regions on cadastral status and maps. It aims to protect the health of the people of the city or town, to supply the economic and agricultural needs of the society, to find the best solutions according to the opportunities that can be provided by balancing the urban functions such as residence, working, resting and transportation within the context of country, region and city data for a quality life (Yıldız, 2014). In Turkey, while almost all local government units have an approved plan, the extent to which

the plan is implemented or can be implemented is not a matter of high concern. In particular, all units of municipalities have to use finalized development plans as a basis, rule and measure in their implementation. It is not possible to take decisions, actions and actions contrary to the plan, and they have to make the necessary programs for the execution of the plan and prepare the zoning regulations in the light of the plan principles (Keleş, 2014). Municipalities shall allow, place and control the execution of their own zoning activities and other construction activities within the municipal boundaries according to the principles in the plan (Keleş, 2014). The zoning plan came into force on 30.09.2017 after the draft dated 03.07.2017. After this date, regulations were added.

The applicability of the zoning plans depends on the fact that the plan is compatible with the actual data and needs of the city. However, sometimes the inaccurate determination of the data and inaccurate predictions in the direction and volume of the development may lead to deviations in the planning objective. As a result of the aforementioned reasons and in cases where the current plan does not meet the needs, it is obligatory to make the plan compatible with the existing data and needs by making changes in the existing plans (Yıldız, 2014). In Turkey, plans prepared with great efforts; and the fact that there is no restriction on the plan change in the Construction Law increases the number of plan changes day by day (Çiçek, 2016). Regulations and changes are listed in Table-a (Development Plans from 2013). and b (Parking Regulations from 1993). Increasing number of changes towards present day can be observed in this table. Although these changes are intended for adaptation and improvement, they also have some negative consequences. The most important problem in practice; This is the question of what will be the status of the constructions that have been started, completed or completed within the scope of the construction permit or the permits obtained in accordance with the existing development plans. It is an absolute problem that needs to be solved if it is necessary to subject the current situation to a new regulation, to cancel construction permits, to demolish the buildings that have been started or completed, and whether the rights gained in case of change in the zoning plan will be protected or if such to what end (Çiçek, 2016).

Development plan is the foundation of the regulations that are used for planning, executing and controlling of construction activities in architectural context. However, in 2018 another regulation, which was covering the permit of buildings contrary to the zoning legislation or license, was forced by the government. This regulation expired at 15.06.2019 and let millions of applicants have permits (URL-15).

4.3.3.19. Employment Low. In Turkey, Occupational Health and Safety Law No. 6331 has been prepared based on the Labor Law No. 4857. The relevant law determines the rights and obligations of the worker and OHS. The basic law on health and safety was the Labor Law No. 4857, within the regulations issued for working life before the Occupational Health and Safety Law No. 6331. The Labor Law No. 4857 provides the worker with the right to make a claim about OHS.

4.3.3.20. Regulatory Bodies in Turkey. The development plans, which are binding for the Municipalities and the Central Government, are also binding for the owners and other citizens. Development plans not only prevent the use of property rights in violation of the public interest; they obligate to comply with the development plans in the construction activities they will undertake, obtain permission from the relevant public administrations, and make the structure in accordance with the permission and license it received (Keleş, 2014).

Apart from the municipalities, there are other control mechanisms. After the earthquakes in our country, many regulations regarding laws and institutions have been introduced. In spite of all these legal regulations, unplanned and unhealthy urbanization could not be prevented due to the immigration in our country, and as a result of illegal and uncontrolled construction, structures which were not safe enough were constructed. In order to eliminate these problems, the Law No. 4708 on Building Audit was issued. This law prohibits the building audit organization from engaging in any other activity other than audit. All kinds of structures (within the scope of the law numbered 4708). is subject to the supervision of the building audit organizations (Ömürbek, 2016). Building audit is responsible for control in terms of project,

construction and document. According to the scale and type of the structure, institutions such as fire department and council of monuments may also be included in the inspection mechanism.

4.3.3.21. The Construction Permit, Occupancy Permit Etc. Procedures. The occupancy permits, which are known as building usage permits, are the documents that there is no harm in settling the buildings according to the conditions determined after the completion. In 2018, there was a more positive trend in the number of immovable settlements compared to building licenses. The supply adjusts itself delayed according to the demand and increases the production with excess if necessary and tries to reach a balance with the excess when necessary. This can be attributed to the fact that former real estates applied for a resettlement. On the other hand, the effects of reconstruction peace initiated on 8 June 2018 can be seen especially on the settlement figures at the end of 2018 and the first half of 2019 (Dalkılıç, 2018).

Table 4.4. Distribution of Occupancy Permits 2017-2018 (TÜİK).

	YEARS			**Change Rate Compared to the First Nine Months of the Previous Year**	
Index	2018	2017	2016	2018	2017
Number of Buildings	85,832	82,763	76,874	3.7	7.7
Acreage	115,499,086	113,710,220	101,941,641	1.6	11.5
Value (TL)	154,846,311,172	120,242,554,590	90,681,036,656	28.8	32.6
Number of Apartments	593,945	572,286	509,713	3.8	12.3

On the other hand, as a major sign of the decrease in supply, as of the nine-month period of 2018, there was a negative change in the building license by -41.4 percent in terms of number of buildings, by 55.1 percent in terms of construction area and by -58.6 percent in terms of number of apartments. In 2018, real estate demand was postponed due to 'exchange rate and interest rate shocks' (Dalkılıç, 2018).

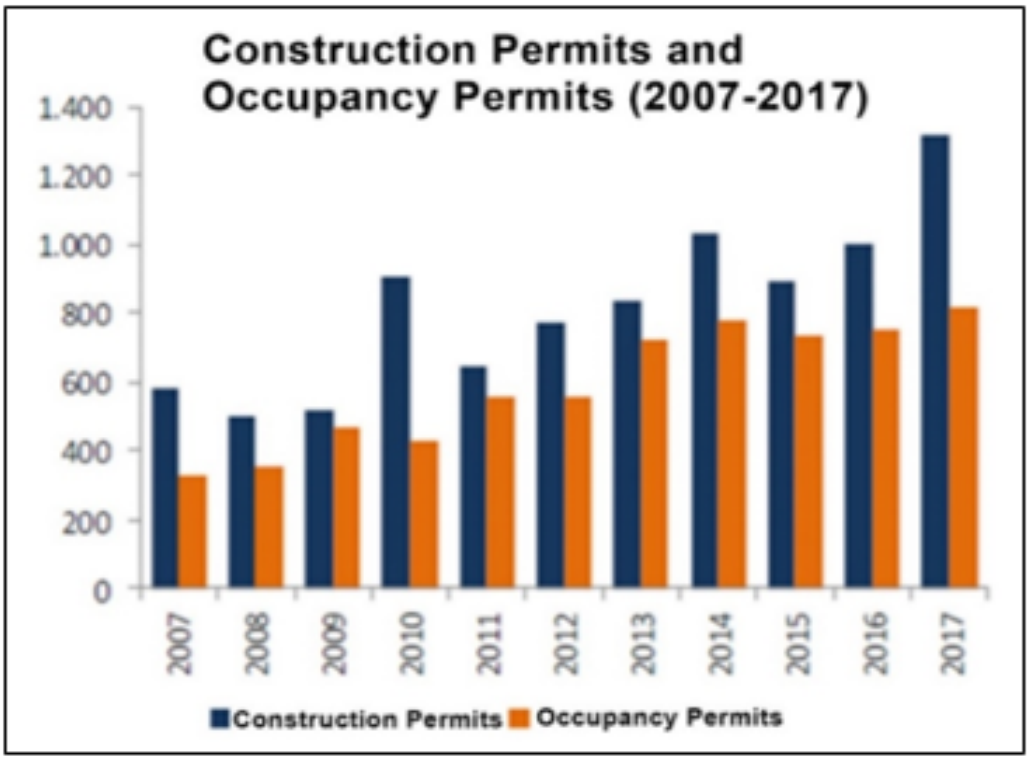

Figure 4.8. Distribution of Construction Permits and Occupancy Permits 2007-2017 (TÜİK, İş Bankası).

4.3.3.22. Health and Safety Requirements. The concept of occupational safety is defined as "all of the methodical studies carried out in order to investigate and prevent hazards for employees arising from working conditions2" (Şahin, 012). The construction sector has its own unique working conditions and is different from each other because each project is different and therefore each project is faced with different working conditions and different risks. For these reasons, the construction sector is at greater risk than other sectors and it is difficult and complex to provide OHS. In the case of occupational accidents, along with the social and humanitarian effects, material losses caused by them are also significant for the employee, employer, business and ultimately for the economy (Çivici, 2019).

In Turkey, No. 6331 Occupational Health and Safety Law came into force in 2012 and regulations issued based on this law, feature a proactive approach for detecting, investigating and predicting possible outcomes of the threat (Çivici, 2019). However,

Occupational health and safety (OHS). measures are difficult to implement and supervise because construction activities in our country are carried out in the context of the main employer-subcontractor relationship and there are more than one subcontractor and employer in construction areas. In addition, the fact that employers act as OHS-related activities as an unnecessary economic burden and employees' unconsciousness and lack of education in this area are among the main causes of workplace accidents (Hacıbektaşoğlu, 2018).

Table 4.5. Social Security Institution Statistics (Hacıbektaşoğlu, 2018).

Years	Construction Sector		Turkey in General		Experienced Occupational Accidents in Construction Sector to Turkey Overall Ratio	Experienced Mortal Occupational Accidents in Construction Sector to Turkey Overall Ratio
	No. Of Occupational Accidents	Death Toll	No. Of Occupational Accidents	Death Toll		
2004	8106	263	83830	841	9.67%	31.27%
2005	6480	290	73923	1096	8.77%	26.46%
2006	7143	397	79027	1601	9.04%	24.80%
2007	7615	359	80602	1044	9.45%	34.39%
2008	5574	297	72963	866	7.64%	34.30%
2009	6877	156	64316	1171	10.69%	13.32%
2010	6437	475	62903	1444	10.23%	32.89%
2011	7749	570	69227	1700	11.19%	33.53%
2012	9209	256	74871	744	12.30%	34.41%
2013	26967	521	191389	1360	14.09%	38.31%
2014	29699	501	221366	1626	13.42%	30.81%
2015	33361	473	241547	1252	13.81%	37.78%
2016	44552	496	286068	1405	15.57%	35.30%
Total	199769	5054	1602032	16150	Avg. 11.22%	Avg. 31.35%

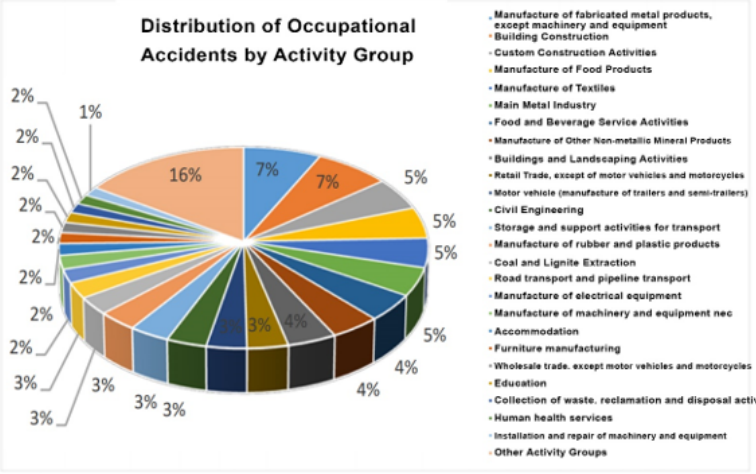

Figure 4.9. Distribution of Death Rates in Occupational Accidents (Chamber of Mechanical Engineers, SSI Statistics).

4.3.4. The Factors Adopted from the Porter's Five Forces Analysis

9 of the external factors included in the interview have been adopted from Porter's Five Forces analysis. The factors adopted from Porter's Five Forces analysis are described below;

- The Degree of the Relative Cost Advantages of Established Companies Associated With Large Volumes of Scale Economies This factor belongs to "the threat of entry into an industry" force of the Porter's Five Forces framework and emphasizes the financial advantage of the existing companies in Turkish construction sector in comparison the new entrants.
- The Degree to Which Government Encourages New Entrants to Entering The Market This factor also belongs to the same factor of "the threat of entry into an industry" and discusses if the new entrants are being encouraged by the government for their potential operations in Turkish construction sector.
- The degree to which an industry depends on suppliers (PM companies). for a large percentage of its total purchases This factor is under Porter's second force of "the power of suppliers into the industry" and discusses whether it is an advantage when the PM companies are effective in the Turkish construction sector, when the sector depends on the PM companies for a large percentage of its total purchases.
- The amount of time, energy, and money for companies in the industry to switch from products/services offered by a supplier to those offered by another supplier Being under the "The power of suppliers into the industry" force, this factor questions whether the Employers would be willing to switch their PM services supplier at any time required or if it would be disadvantageous for them due to the amount of time, energy and money to be spared during the supplier change.
- The degree to which an industry depends on the buyers (Employers). for a large percentage of its total sales This factor is under the third category of "the power of buyers of the industry's products or services". Similar to the factor emphasizing the supplier's power above, it is discussed whether it is an advantage when the Employers are effective in the Turkish construction sector, when the sector depends on the PM companies for a large percentage of its total sales.

- The degree to which products/services of an industry are differentiated so that buyers cannot find alternative suppliers This factor again comes from the force of "the power of buyers of the industry's products or services". The product/service differentiation is a prominent phenomenon nowadays however, this factor evaluates the interviewees' opinions on the cases when the Employers cannot find alternative PM companies in the sector to provide their specific requirement.
- The number of existing substitute services (PM companies). in the industry as a competitive factor This factor belongs to the forth force of "the threat of substitutes to the industry's products or services" of the Porter's Five Forces framework. It is discussed if the existing substitute PM services providers in the Turkish construction sector are being considered by the interviewees as a competitive factor.
- The degree of differentiation in products/services offered by companies in an industry This factor is under the category of the fifth force of "the extent of rivalry between existing competitors in the industry" and discussed if the fact that provided PM services in Turkish construction industry have excessively differentiated is being considered as an advantage or disadvantage.
- The difference between capacity and demand As the last factor of "the extent of rivalry between existing competitors in the industry" force, the interviewees are asked to evaluate the effects when there is difference between the job capacity in the sector and demanding PM services providers.

4.3.5. The Factors Adopted from the Strategic Group Analysis

The contribution of the strategic group analysis part differs from the previous two frameworks. Strategic group analysis provides the interviewees nominal questions in order to evaluate the strategic behavior of the companies, whereas the PESTEL analysis and Porter's Five Forces analysis provided factors for the interviewees' evaluations. The nominal questions asked to the interviewees are listed below;

- The differentiation strategy of your company: Price differentiation / Quality differentiation

- The diversification strategy of the company: Only the specific scopes of construction PM services in construction sector (such as contract management, QA/QC, etc.). / Only construction / construction related sectors / Diversified in sectors unrelated to construction.
- The approximate ratio of foreign and local investors of the projects in Turkey: the breakdown of % local investor and % foreign investor.
- The project type having the highest percentage in total numbers of projects: Infrastructure / Transportation / Superstructure (residence, mall, hotel). / Industrial / Water structures
- The client type having the highest percentage in total number of projects: Government / Private Sector
- The strategic planning approach of the company; Systematic and regular strategic planning / No systematic approach for strategic planning
- The strategic decision-making approach of the company: Democratic and collaborative environment / Autocratic approach

4.3.6. Strengths and Weaknesses factors

Within the context of this study, the internal factors discussed with the interviewees have been adopted from the reference studies in the literature as explained in the above Section. The extensive list of the internal factors have been established from the literature review. During the preparation phase and the pilot study of the interview content, 34 internal factors have been shortlisted under 5 categories.

The internal factors have been given to the interviewees for their evaluations according to their positive or negative effects to the company's' success together with the importance perception for each factor. The internal factors, which have been evaluated as the capabilities by the interviewees are given below;

4.3.6.1. The Factors Related to Effectiveness of Strategies. 6 of the internal factors included in the interview are related to the effectiveness of strategies as described

below;

- Diversification strategies imply extending the service diversity of the company or offering the services in new cities / countries.
- Market selection strategies refers to the extensive investigation and survey of the markets that offer potential business opportunities.
- Project selection strategies stands for creating new strategies while utilizing new methodologies and procedures when selecting upcoming projects.
- Client selection strategies require creating new strategies while utilizing new methodologies and procedures during business development phase for the upcoming clients.
- Partner selection strategies mean investigating the supplementary and proper partner that is convenient for the project.
- Bidding strategies refer to the strategies established to be awarded to a project in terms of deployment schedule studies, cost and work schedule studies, etc.

The below Table 4.6 provides the list of key references found in the literature for the internal factors related to the effectiveness of strategies:

Table 4.6. The Factors related to Effectiveness of Strategies.

Factor	**Key references**
Effectiveness of strategies	
Diversification strategies	Yates (1994); Warszawski (1996)
Market selection strategies	Warszawski (1996); Lu *et al.* (2008)
Project selection strategies	Warszawski (1996)
Client selection strategies	Warszawski (1996)
Partner selection strategies	Warszawski (1996); Ozorhon *et al.* (2007)
	Holt *et al.* (1994); Venegas and Alarcon
	(1997); Hatush and Skitmore (1997);
Bidding strategies	Dikmen and Birgonul (2003); Ajitabh
	and Momaya (2004); El-Diraby *et al.* (2006)

4.3.7. The Factors Related to Managerial Strategies

10 of the internal factors included in the interview are related to the managerial strategies as described below;

- Quality management stands for the quality assessment and quality control procedure of the company that define the quality approach and service quality of the company.
- Time management is the planning capabilities of the company in order to provide the accurate planning, progress update and on time completion of the project.
- Cost management is the commercial capabilities of the company that enables the project cost planning, budget update, claim management and within cost completion of the projects.
- Health and safety management refers to the health and safety capabilities of the company in terms of having qualified health and safety staff and presenting efficient health and safety management on site.
- Environmental management implies the environmental protection awareness of the company in terms of having qualified environmental management staff and presenting efficient environmental management on site.
- Risk management stands for a company's risk management capabilities throughout the project starting from the risk analysis, regular risk assessments, mitigation plans when necessary and risk monitoring.
- Site management is a major capability in construction industry that require the management of all parties (including but not limited to the contractors, subcontractors, suppliers, manufacturers, design supervision teams and consultants). and all activities on site.
- Claim management refers to the management of any type of claims received from the contractors and other participants by the clients such as variation orders, delay notices, extension of time requests, etc.
- Contractor management is the proper and effective coordination of the contractors and subcontractors in the projects.
- Knowledge management is the capability of the PM company that include spec-

ify, obtain, preserve, reach, archive and distribute any type of knowledge in the projects.

The below Table 4.7 provides the list of key references found in the literature for the internal factors related to the managerial strategies:

Table 4.7. The Factors related to Managerial Strategies.

	Key references
Managerial capabilities	
Quality management	Yates (1994); Warszawski (1996); Venegas and Alarcon (1997); Shen *et al.* (2003); Flanagan *et al.* (2007); Cheah *et al.* (2007); Lu *et al.* (2008); Orozco *et al.* (2011); Tan *et al.* (2012)
Time management	Warszawski (1996); Venegas and Alarcon (1997); Shen *et al.* (2003, 2004); El-Diraby *et al.* (2006); Tan *et al.* (2007)
Cost management	Warszawski (1996); Shen *et al.* (2003, 2004); El-Diraby *et al.* (2006); Tan *et al.* (2007); Lu *et al.* (2008)
Health and safety management	Venegas and Alarcon (1997); Hatush and Skitmore (1997); Shen *et al.* (2004); El-Diraby *et al.* (2006); Tan *et al.* (2012)
Environmental management	Shen *et al.* (2003, 2004); Tan *et al.* (2007); Flanagan *et al.* (2007); Orozco *et al.* (2011)
Risk management	Yates (1994); Shen *et al.* (2004); Tan *et al.* (2007); Flanagan *et al.* (2007); Lu *et al.* (2008); Orozco *et al.* (2011); Tan *et al.* (2012)
Site management	Shen *et al.* (2003); Tan *et al.* (2007); Lu *et al.* (2008); Tan *et al.* (2012)
Claim management	Lu *et al.* (2008); Tan *et al.* (2012)
Subcontractor management	Tan *et al.* (2007); Orozco *et al.* (2011)
Knowledge management	Warszawski (1996); Orozco *et al.* (2011)

4.3.8. The Factors Related to Organizational Capabilities

5 of the internal factors included in the interview are related to the organizational capabilities as described below;

- Knowledge and expertise in the market is having a solid track record including projects completed in domestic and abroad markets and comprising various types of PM services.
- Experience in similar projects is having the specific track record compatible with the upcoming project type such as infrastructure, transportation, superstructure (residence, mall, and hotel), industrial, water structures, etc.
- Flexibility and adaptability to market changes refers to the company's capability to adapt and tolerate any kind of changes in the market conditions such as business volume changes, foreign investor effects, economical changes, etc.
- Organizational culture/structure means the values of a company that define the company's missions, visions, short term and long term objectives.
- Image and reputation implies the recognition of a PM company by the clients, contractors, rivals and social media and the level of reputation gained.

The below Table 4.8 provides the list of key references found in the literature for the internal factors related to the organizational strategies:

Table 4.8. The Factors related to Organizational Strategies.

Factor	**Key references**
C. Organizational capabilities	
Knowledge and expertise in the market	Shen *et al.* (2004); Ajitabh and Momaya (2004)
Experience in similar projects	Holt *et al.* (1994); Shen *et al.* (2003); Ozorhon *et al.* (2006)
Flexibility and adaptability to market changes	Yates (1994); Warszawski (1996); Ajitabh and Momaya (2004); Tan *et al.* (2007; 2012)
Organizational culture/structure	Shen *et al.* (2003); Ajitabh and Momaya (2004); El-Diraby *et al.* (2006); Tan *et al.* (2007); Flanagan *et al.* (2007)
Image and reputation	Hatush and Skitmore (1997); Dikmen and Birgonul (2003); Shen *et al.* (2003, 2004); Ajitabh and Momaya (2004); El-Diraby *et al.* (2006); Tan *et al.* (2007); Flanagan *et al.* (2007)

4.3.9. The Factors Related to Efficiency of Technical Resources

3 of the internal factors included in the interview are related to the efficiency of technical resources as described below;

- Use of IT refers to the information technologies capabilities of a company for the business purposes to be utilized in the projects as well as for the company use in terms of hardware, software and having qualified IT staff.
- Innovation capability is the capability of the company to establish new business approaches, management procedures or new technologies to be utilized in the business.
- Investment on RandD is being capable of conducting research and development studies and being able to implement the established ideas / methods to the business.

The below Table 4.9 provides the list of key references found in the literature for the internal factors related to the efficiency of technical resources:

Table 4.9. The Factors related to the Efficiency of Technical Resources.

Factor	**Key references**
Efficiency of technical resources	
Use of IT	Warszawski (1996); Dikmen and Birgonul (2003)
Innovation capability	Yates (1994); Warszawski -1996
Investment on R&D	Venegas and Alarcon (1997); Dikmen and Birgonul (2003)

4.3.10. The factors related to Efficiency of Human Resources

3 of the internal factors included in the interview are related to the efficiency of human resources as described below;

- Current capacity of human resources refers to the qualifications of the existing HR personnel.
- Development and use of human resources is the capability of the HR department in terms of recruitment, performance review, providing development opportunities to the personnel, etc.
- Communication and coordination among departments implies establishing a professional working environment between the departments which may also effect the businesses in a positive way.

The below Table 4.10 provides the list of key references found in the literature for the internal factors related to the efficiency of human resources:

Table 4.10. The Factors related to the Efficiency of Technical Resources.

Factor	**Key references**
Efficiency of human resources	
Current capacity of human resources	Venegas and Alarcon (1997); Shen *et al.* (2003, 2004); Lu *et al.* (2008)
Development and use of human resources	Warszawski (1996)
Communication and coordination among departments	Yates (1994); Venegas and Alarcon (1997)

4.3.11. The Factors Related to Efficiency of Financial Resources

3 of the internal factors included in the interview are related to the efficiency of financial resources as described below;

- Credibility refers to the credibility score achieved from the relevant bodies, the value of loans obtained annually, having good relations with the banks and having vast knowledge about the financial policy.
- Financial Status defines the financial condition of the company in terms of asset status, revenue, profit, debt status, tax declarations, etc.

- Financial Stability is the company's capability for bearing up financially against any possible financial, political, social external effects.

The below Table 4.11 provides the list of key references found in the literature for the internal factors related to the efficiency of financial resources:

Table 4.11. The Factors related to the Efficiency of Financial Resources.

Factor	**Key references**
F. Efficiency of financial resources	
Credibility	Shen *et al.* (2004); Tan *et al.* (2007)
Financial Status	Warszawski (1996); Hatush and Skitmore (1997)
Financial Stability	Shen *et al.* (2003); Lu *et al.* (2008)

4.3.12. The Factors Related to Effectiveness of Relationships

3 of the internal factors included in the interview are related to the effectiveness of relationships as described below;

- Relationship with clients/owners defines efficient communication with the clients during the project.
- Relationship with suppliers/subcontractors refers to efficient communication with the suppliers/subcontractors during the project.
- Relationship with designers/consultants refers to efficient communication with the designers/consultants during the project.
- Relationship with government entities defines efficient communication with the government entities when required.

The below Table 4.12 provides the list of key references found in the literature for the internal factors related to the effectiveness of relationships:

Table 4.12. The Factors related to the Effectiveness of Relationships.

Factor	**Key references**
G. Effectiveness of relationships	
Relationship with clients/owners	Dikmen and Birgonul (2003); Shen *et al.* (2003); Tan *et al.* (2007)
Relationship with suppliers/subcontractors	Warszawski (1996); Shen *et al.* -2003
Relationship with designers/consultants	Tan *et al.* (2007); Orozco *et al.* -2011
Relationship with government entities	Shen *et al.* (2003); Ozorhon *et al.* (2006); Tan *et al.* (2007); Orozco *et al.* (2011)

4.4. Statistical Analysis Method

As defined in Merriam Webster's dictionary, statistics is specified as a branch of mathematics in order to deal with the collection of the data as well as its analysis and interpretation. In order to assess the relations and variance between factors investigated in interviews, descriptive statistics are utilized in this study with the help of software package of SPSS Statistics version 24.0. Descriptive statistics is basically simplifying a large number of data in a meaningful way in order to define the basic characteristics of the samples as an approach to a population in a study. In other words, the data is presented and converted in simple graphs, and the basic characteristics of the data can be grasped to draw conclusions suitable for statistical analysis. Descriptive statistics such as percentage of population, mean, median, standard deviation, variance, mean ranking, Cronbach's alpha for reliability and skewness for normality are given as a result of statistical analyzes conducted by SPSS. Some critical definitions are given below.

Skewness in a sample is checked in order to measure the symmetry of the sampled data. The symmetry of the data can be seen when it is plotted. When the data is skewed or unsymmetrical, the tail of the data plot looks extended to one side rather than a bell shape of symmetrical normal distribution. The skewness of a data set is

usually compared with plot of a normal distribution. Many researchers claimed in recent decades that a data set can be classified as normally distributed based on their skewness values. Values of skewness within the range of -1 to +1 indicate a normal distribution the data (Hair *et al.*, 2006). In addition to that, Sposito and Skarpness (1983) claims that skewness and kurtosis values within range of +2.2 and -2.2 can be considered as normal distribution.

Mean ranking enables to determine the significance of each factor based on ratings by the respondents. The formula for calculation of mean ranking is given below:

$$\text{Mean} = \frac{\sum_{i=1}^{5} iN_i}{\sum_{i=1}^{5} N_i} \tag{4.1}$$

A reliability coefficient is introduced by Cronbach in 1951 for a data set to test the internal consistency, which is named as Cronbach's alpha. The coefficient is calculated by averaging the correlation of elements within a test. The correlation value can be ranged from 0 to 1 which refers to implication of results from unreliable to reliable (Graham and Lilly, 1984). Cronbach's alpha values greater than 0.70 are found to be satisfactory as per Nunally's recommendation (1978). The formula for calculation of Cronbach's Alpha in SPSS is given below:

$$\alpha = \frac{k\overline{\text{cov}}/\overline{\text{var}}}{1 + (k-1)\overline{\text{cov}}/\overline{\text{var}}} \tag{4.2}$$

where k refers to the number of items, var refers to the average variance while k_{cov} is the average covariance between items.

5. ANALYSIS AND RESEARCH FINDINGS

In this chapter, the data collected through the interviews is analyzed statistically and the strategies are established accordingly. It has been explained in the previous chapters that the targeted interviewees are sector professionals with high level titles currently working in construction project management companies in Turkey. High level title has been targeted for the interviewees since the evaluation and perception of the factors of the interview require administrative approach. As a result of the questionnaire survey, 22 face-to-face interviews have been conducted out of 32 longlisted companies, which resulted in approximately 69% response rate.

Before commencing the further statistical analysis, the collected data is reviewed in order to ensure the reliability and the validity. However, since the data has been collected via face-to-face interviews, it has been ensured that all the interviewees have well understood all the questions and responded properly. After the review, the results have been statically analyzed. In the first part of this chapter, the statistical findings are explained in details with the supportive figures. Descriptive statistics including the range, minimum, and maximum values, mean, standard error, standard deviation, skewness etc. can be found in Appendix B.

5.1. Descriptive Statistics

As a result of interview survey and data review, descriptive statistics studied using the interview results of 22 interviewees. The detailed presentation of descriptive statistics firstly begins with the general characteristics of the interviewees and their companies and continues with the descriptive statistics of the external and internal factors. Hence, the following Sections utilize the descriptive statistics to explain the overall profile of the collected data.

5.1.1. General Information about the Interviewees and Their Companies

The descriptive statistics have been studied for the first part of the interview, where data has been collected regarding the interviewee's title, profession, experience as well as his/her company's origin, years of experience, approximate headcount and the provided services. Demographic information regarding the interviewees and their companies reveal a high level profile of the construction project management sector. This profile has been visualized via below figures.

Figure 5.1 indicates the distribution of respondents' professions and positions. According to the below figure, the majority of the interviewees are civil engineers (59%). and architects (32%). One interviewee is mechanical engineer and one interviewee is electrical engineer. It can be seen that 50% of the interviewees work as managers / leads in the construction project management companies. 28% of the interviewees are company owners / partners and 14% work as director. One general manager and one CEO have also participated the study.

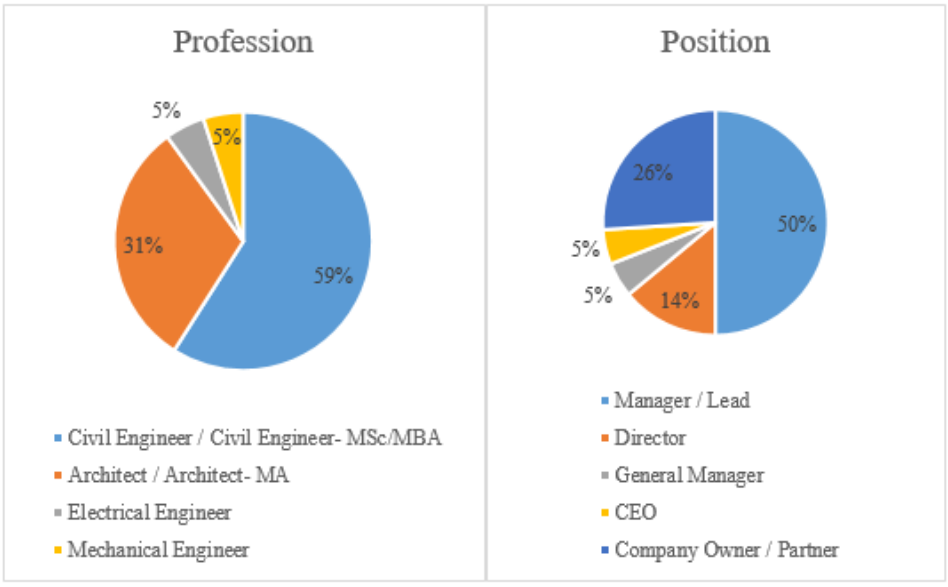

Figure 5.1. Professions and Positions of the Interviewees.

Figure 5.2 presents the distribution of the professional experience of the interviewees in construction sector and their professional experience in project management

separately. Referring to the below figure, majority of the interviewees have more than 20 years of experience in construction sector (64%). Narrowing the experience down to project management practice, the years of experience decrease as it can be seen from the below figure. The reason can be explained by the relatively late application of the construction project management practices in Turkey.

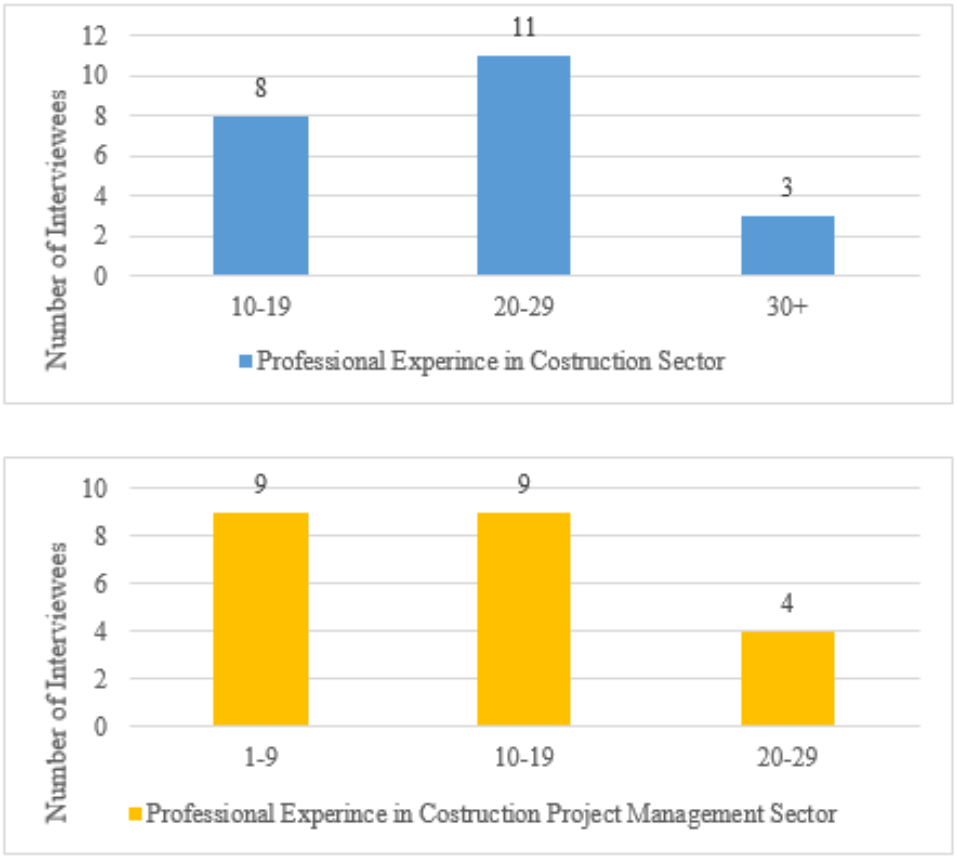

Figure 5.2. Professional experience of the interviewees.

As mentioned in previous Section, 22 face-to-face interviews have been conducted out of 32 longlisted companies. Out of these 22 companies, 11 companies are international construction management companies operational in Turkey and 11 companies are local companies (Figure 5.3).

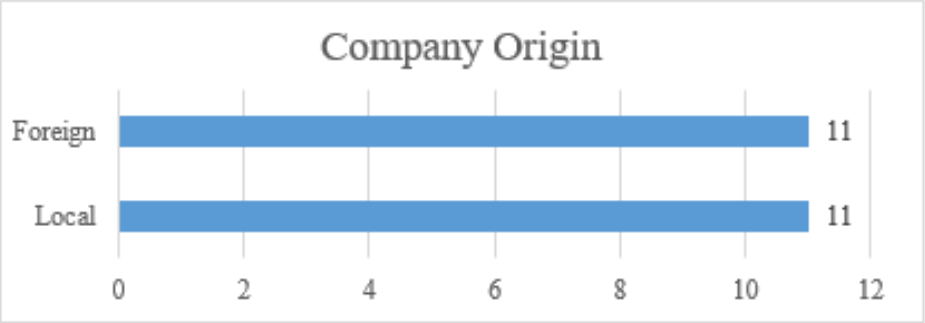

Figure 5.3. Company Origin.

Figure 5.4 shows the distribution of the companies' age. This figure provides us the establishment of the local companies and the years of operation of the foreign companies in Turkey. According to the figure, it is seen that the majority of the companies have 10 to 19 years of experience in Turkey (50%). 23% of the companies have 1 to 9 years' experience and 27% of the companies have 20 to 29 years'cexperience. One company has the experience exceeding 30 years (5%)

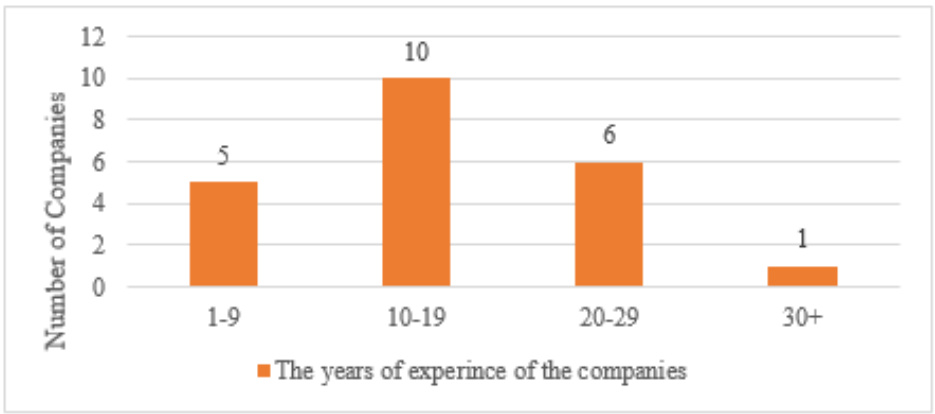

Figure 5.4. Distribution of companies in terms of their age.

Figure 5.5 indicates the distribution of the companies' headcounts. According to the figure, it is seen that 41% of the companies have less than 20 employees and 36% of the companies have more than 100 employees. 23% of the companies have 21 to 100 employees.

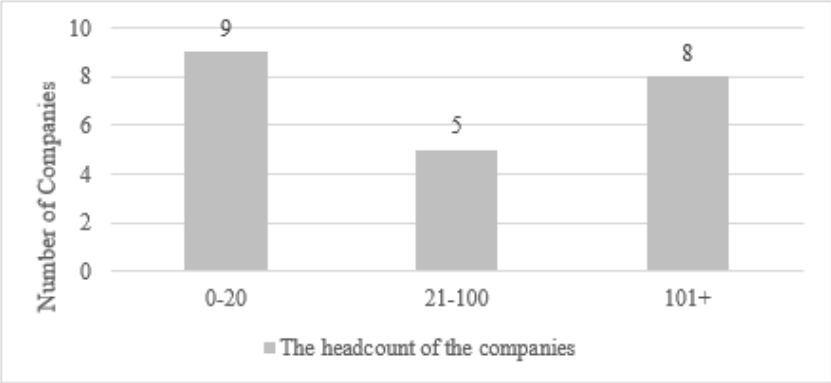

Figure 5.5. Distribution of companies' headcount.

In the previous Sections, it has been explained that the project management processes are grouped under 12 knowledge areas, which are Project Integration Management, Project Scope Management, Project Schedule Management, Project Cost Management, Project Quality Management, Project Resource Management, Project Communication Management, Project Risk Management, Project Procurement Management, Project Stakeholder Management, Project Health, Safety, Security and Environmental Management and Project Financial Management. During the interviews, the interviewees are requested to mark the knowledge areas which their companies provide as services in Turkey. Figure 5.6 indicates the number of the companies clustered for each knowledge area. 6 interviewees claimed that they provide all 12 services.

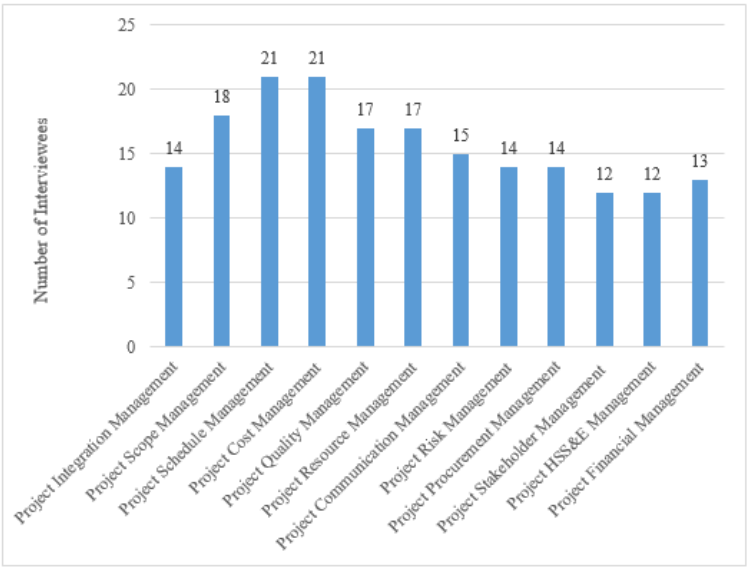

Figure 5.6. Distribution of companies' services.

5.1.2. Distribution of Rating Levels of External Factors

The external factors affecting the Turkish construction project management sector are selected after an extensive research for the external analysis in the literature. According to the proposed conceptual framework of this study, which is explained in the previous chapters, Pestel Analysis Factors (Macro Environment Analysis), Porter's Five Forces (Micro Environment Analysis) and Strategic Group frameworks have been utilized in order to determine the factors. The selected factors are explained in details in Chapter 4 of this study. During the evaluation of the results, the external factors adopted from 3 different frameworks have been shortlisted according to the responses of the interviewees in order to generate the opportunity and threat factors of the SWOT tables. This study has been conducted for all interviews, the interviews of the local companies and the interviews of the international companies separately in order to create the SWOT tables for all 3 clusters separately and achieve separate strategies accordingly.

5.1.2.1. Evaluation of the Factors adopted from Pestel Analysis. The interviewees have been asked to evaluate the 23 external factors adopted from Pestel framework according to their positive or negative effects to their companies' success. Then they have been requested to grade the importance of each factor in Likert scale as 1 having the least and 5 having the highest importance according to their contribution to their companies' success positively or negatively.

The below Table 5.1, Table 5.2 and Table 5.3 show the distribution of the external factors adopted from Pestel as evaluated positive or negative by the interviewees as well as their average importance factor values clustered for all results, results collected from local companies and results collected from international construction project management companies separately. The factors which are rated as having the highest importance are specified. Among the highest rated factors, the factors which are mostly rated as positive and negative are determined. The mostly positive rated factors are marked with green and the mostly negative rated factors are marked with

red in the below Table 5.1, Table 5.2 and Table 5.3. The tables filtered according to the highest importance factors are given in Appendix C.

Table 5.1. Pestel Factors Results of All Interviews.

			General				
Category	**abb.**	**Factor name**	**positive**	**negative**	**irrelevant**	**opportunity / threat no of (+) - no of (-)**	**Avg.**
political	P1	Government stability and policies	12	10	0	2	4.05
political	P2	Tax policy and trade controls	9	9	4	0	3.23
political	P3	Elections	0	19	3	-19	3.68
political	P4	Threats to homeland security (terrorism, etc.)	0	21	1	-21	3.77
economic	E1	Likely changes in the economy	5	16	0	-11	3.73
economic	E2	International trends	14	4	4	10	3.09
economic	E3	Job growth in the market	14	7	1	7	3.77
economic	E4	Inflation and interest rates	1	20	1	-19	3.68
economic	E5	Unemployment and labor supply	8	13	1	-5	2.59
economic	E6	Levels of disposable income across economy and income distribution	11	9	2	2	3.18
social	S1	Health, education and social mobility of the population	11	7	4	4	2.91
social	S2	Consumer attitudes	14	7	1	7	4.00
social	S3	Advertising and media	17	0	5	17	3.14
social	S4	National and regional culture	11	9	2	2	3.23
technological	T1	Impact of new technologies	22	0	0	22	3.73
technological	T2	Internet and new software	21	0	1	21	3.73
environmental	E1	Local environmental issues	17	2	3	15	3.09
environmental	E2	Local waste disposal and material transfer procedures	14	6	2	8	3.00
legal	L1	Local legislations	12	8	2	4	2.91
legal	L2	Employment low	16	2	4	14	2.95
legal	L3	Regulatory bodies in Turkey	18	4	0	14	3.09
legal	L4	The construction permit, occupancy permit etc. procedures	8	14	0	-6	3.36
legal	L5	Health & Safety Requirements	22	0	0	22	3.27

Table 5.2. Pestel Factors Results of the Interviews with Local Companies.

			Local				
Category	**abb.**	**Factor name**	**positive**	**negative**	**irrelevant**	**opportunity / threat no of (+) - no of (-)**	**Avg.**
political	P1	Government stability and policies	7	4	0	3	4.18
political	P2	Tax policy and trade controls	5	4	2	1	3.18
political	P3	Elections	0	10	1	-10	3.91
political	P4	Threats to homeland security (terrorism, etc.)	0	10	1	-10	3.82
economic	E1	Likely changes in the economy	2	8	0	-6	3.91
economic	E2	International trends	7	1	3	6	2.91
economic	E3	Job growth in the market	8	2	1	6	4.09
economic	E4	Inflation and interest rates	1	10	0	-9	3.82
economic	E5	Unemployment and labor supply	6	5	0	1	2.55
economic	E6	Levels of disposable income across economy and income distribution	6	4	1	2	3.00
social	S1	Health, education and social mobility of the population	8	1	2	7	3.27
social	S2	Consumer attitudes	7	4	0	3	4.36
social	S3	Advertising and media	8	0	3	8	3.18
social	S4	National and regional culture	3	7	1	-4	3.45
technological	T1	Impact of new technologies	11	0	0	11	3.82
technological	T2	Internet and new software	10	0	1	10	3.73
environmental	E1	Local environmental issues	7	1	3	6	3.09
environmental	E2	Local waste disposal and material transfer procedures	6	3	2	3	3.27
legal	L1	Local legislations	7	3	1	4	2.82
legal	L2	Employment low	9	0	2	9	3.00
legal	L3	Regulatory bodies in Turkey	10	1	0	9	3.27
legal	L4	The construction permit, occupancy permit etc. procedures	3	8	0	-5	3.73
legal	L5	Health & Safety Requirements	11	0	0	11	3.45

Table 5.3. Pestel Factors Results of the Interviews with International Companies.

			Int'l				
Category	**abb.**	**Factor name**	**positive**	**negative**	**irrelevant**	**opportunity / threat no of (+) - no of (-)**	**Avg.**
political	P1	Government stability and policies	5	6	0	-1	3.91
political	P2	Tax policy and trade controls	4	5	2	-1	3.27
political	P3	Elections	0	9	2	-9	3.45
political	P4	Threats to homeland security (terrorism, etc.)	0	11	0	-11	3.73
economic	E1	Likely changes in the economy	3	8	0	-5	3.55
economic	E2	International trends	7	3	1	4	3.27
economic	E3	Job growth in the market	6	5	0	1	3.45
economic	E4	Inflation and interest rates	0	10	1	-10	3.55
economic	E5	Unemployment and labor supply	2	8	1	-6	2.64
economic	E6	Levels of disposable income across economy and income distribution	5	5	1	0	3.36
social	S1	Health, education and social mobility of the population	3	6	2	-3	2.55
social	S2	Consumer attitudes	7	3	1	4	3.64
social	S3	Advertising and media	9	0	2	9	3.09
social	S4	National and regional culture	8	2	1	6	3.00
technological	T1	Impact of new technologies	11	0	0	11	3.64
technological	T2	Internet and new software	11	0	0	11	3.73
environmental	E1	Local environmental issues	10	1	0	9	3.09
environmental	E2	Local waste disposal and material transfer procedures	8	3	0	5	2.73
legal	L1	Local legislations	5	5	1	0	3.00
legal	L2	Employment low	7	2	2	5	2.91
legal	L3	Regulatory bodies in Turkey	8	3	0	5	2.91
legal	L4	The construction permit, occupancy permit etc. procedures	5	6	0	-1	3.00
legal	L5	Health & Safety Requirements	11	0	0	11	3.09

The highest rated factors, which are mostly evaluated as having positive effects, are selected to be included as opportunity in the SWOT tables. The highest rated factors, which are mostly evaluated as having negative effects, are selected to be in-

cluded as threat in the SWOT tables. Figure 5.7 indicates the list of opportunities and threats adopted from the Pestel factors to be included in the SWOT tables of the whole interviewees, local companies and international companies.

		General		Local		Int'l	
		Opp.	Thr.	Opp.	Thr.	Opp.	Thr.
P1	Government stability and policies	✓	☐	✓	☐	☐	✓
P3	Elections	☐	✓	☐	✓	☐	✓
P4	Threats to homeland security (terrorism, etc.)	☐	✓	☐	✓	☐	✓
E1	Likely changes in the economy	☐	✓	☐	✓	☐	✓
E3	Job growth in the market	✓	☐	✓	☐	✓	☐
E4	Inflation and interest rates	☐	✓	☐	✓	☐	✓
S2	Consumer attitudes	✓	☐	✓	☐	✓	☐
T1	Impact of new technologies and Internet and new software	✓	☐	✓	☐	✓	☐
L4	The construction permit, occupancy permit etc. procedures	☐	✓	☐	✓	☐	☐

Figure 5.7. Opportunities and Threats Obtained from the Pestel Analysis.

5.1.2.2. Evaluation of the Factors adopted from Porter's Five Forces Analysis. The interviewees have been asked to evaluate the 9 statements adopted from Porter's Five Forces framework according to their positive or negative contributions to their companies' success. Then they have been requested to grade the importance of each statement as 1 having the least and 5 having the highest importance according to their contribution to their companies' success positively or negatively. The below Table 5.4, Table 5.5 and Table 5.6 show the distribution of the statements adopted from Porter's Five Forces as evaluated positive or negative by the interviewees as well as their average importance factor values clustered for all results, results collected from local companies and results collected from international construction project management companies separately. The statements which are rated as having the highest importance are specified. Among the highest rated statements, the ones which are mostly rated as positive and negative are determined. The mostly positive rated factors are marked with green and the mostly negative rated factors are marked with red in the below Table 5.4, Table 5.5 and Table 5.6. The tables filtered according to the highest importance factors are given in Appendix C.

Table 5.4. Porter's Five Forces Statements Results of All Interviews.

			General			
#	category	Statement	positive	negative	Opportunity / threat no of (+) - no of (-)	Avg.
P1.1	The threat of entry into an industry	The degree of the relative cost advantages of established companies associated with large volumes of scale economies.	11	11	0	3.36
P1.2	The threat of entry into an industry	The degree to which government encourages new entrants to entering the market.	7	15	-8	3.18
P2.1	The power of suppliers into the industry	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	14	8	6	3.68
P2.2	The power of suppliers into the industry	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	13	9	4	3.55
P3.1	The power of buyers of the industry's products or services	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	14	8	6	3.86
P3.2	The power of buyers of the industry's products or service	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service.	19	3	16	3.86
P4.1	The threat of substitutes to the industry's products or services	The number of existing substitute PM companies in the industry as a competitive factor	12	10	2	3.36
P5.1	The extent of rivalry between existing competitors in the industry	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	12	10	2	3.59
P5.2	The extent of rivalry between existing competitors in the industry	The difference between capacity of PM companies and demand of the Employers	13	9	4	3.00

Table 5.5. Porter's Five Forces Statements Results of the Interviews with Local Companies.

			Local			
#	category	Statement	positive	negative	Opportunity / threat no of (+) - no of (-)	Avg.
P1.1	The threat of entry into an industry	The degree of the relative cos t advantages of established companies associated with large volumes of scale economies.	5	6	-1	3.45
P1.2	The threat of entry into an industry	The degree to which government encourages new entrants to entering the market.	4	7	-3	3.45
P2.1	The power of suppliers into the industry	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	4	7	-3	3.73
P2.2	The power of suppliers into the industry	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	9	2	7	3.45
P3.1	The power of buyers of the industry's products or services	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	4	7	-3	3.91
P3.2	The power of buyers of the industry's products or service	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service.	9	2	7	3.91
P4.1	The threat of substitutes to the industry's products or services	The number of existing substitute PM companies in the industry as a competitive factor	5	6	-1	3.36
P5.1	The extent of rivalry between existing competitors in the industry	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	4	7	-3	3.73
P5.2	The extent of rivalry between existing competitors in the industry	The difference between capacity of PM companies and demand of the Employers	7	4	3	2.73

Table 5.6. Porter's Five Forces Statements Results of the Interviews with International Companies.

			Int'l			
#	category	Statement	positive	negative	opportunity / threat no of (+) - no of (-)	Avg.
P1.1	The threat of entry into an industry	The degree of the relative cost advantages of established companies associated with large volumes of scale economies.	6	5	1	3.27
P1.2	The threat of entry into an industry	The degree to which government encourages new entrants to entering the market.	3	8	-5	2.91
P2.1	The power of suppliers into the industry	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	10	1	9	3.64
P2.2	The power of suppliers into the industry	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	4	7	-3	3.64
P3.1	The power of buyers of the industry's products or services	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	10	1	9	3.82
P3.2	The power of buyers of the industry's products or service	The degree to which services of the PM industry are differentiated so tha t employers cannot find alternative companies for a specific service.	10	1	9	3.82
P4.1	The threat of substitutes to the industry's products or services	The number of existing substitute PM companies in the industry as a competitive factor	7	4	3	Mar-36
P5.1	The extent of rivalry between existing competitors in the industry	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	8	3	5	3.45
P5.2	The extent of rivalry between existing competitors in the industry	The difference between capacity of PM companies and demand of the Employers	6	5	1	3.27

The highest rated statements, which are mostly evaluated as having positive effects, are selected to be included as opportunity in the SWOT tables. The highest

rated statements, which are mostly evaluated as having negative effects, are selected to be included as threat in the SWOT tables. Figure 5.8 indicates the list of opportunities and threats adopted from the Porter's Five Forces statements to be included in the SWOT tables of the whole interviewees, local companies and international companies.

		General		Local		Int'l	
#	Statement	Opp.	Thr.	Opp.	Thr.	Opp.	Thr.
P3.1	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service	✓	□	✓	□	✓	
P3.2	The degree to which an industry depends on the PM companies for a large percentage of its total sale	✓		□	✓	✓	

Figure 5.8. Opportunities and Threats Obtained from Porter's Five Forces Analysis.

5.1.2.3. Evaluation of the Strategic Group Analysis Questions Responses. In this part of the interviews, 7 nominal questions have been asked to the interviewees in order to evaluate the strategic behavior of the companies as per the Strategic Group Analysis method.

The below Table 5.7 shows the responses distributions of the nominal questions adopted from Strategic Group Analysis clustered for all results, results collected from local companies and results collected from international construction project management companies separately.

The answers which create conflict between the interviewees have been selected and evaluated for the further SWOT study.

Table 5.7. Strategic Group Analysis Nominal Questions Results.

The differentiation strategy of your company:	Total	Local	Int'l
Price differentiation	1	1	0
Quality differentiation	21	10	11
The diversification strategy of the company:	Total	Local	Int'l
Only the specific scopes of construction PM services in construction sector (such as contract management, QA/QC, etc.)	6	5	1
Only construction construction related sectors	15	6	9
Diversified in sectors unrelated to construction	1	0	1
The approximate ratio of foreign and local investors of the projects in Turkey:	Local	Int'l	
% local investor:	43.18%	53.63%	32.73%
% foreign investor:	56.82%	46.37%	67.27%
The project type having the highest percentage in total numbers of projects:	Local	Int'l	
Infrastructure	1	0	1
Transportation	1	0	1
Superstructure (residence , mall, hotel)	19	11	8
Industrial	1	0	1
Water structures	0	0	0
The client type having the highest percentage in total number of projects:		Local	Int'l
Government	1	0	1
Private Sector	20	11	10
The strategic planning approach of the company;	Total	Local	Int'l
Systematic and regular strategic planning	19	8	11
No systematic approach for strategic planning	3	3	0
The strategic decision-making approach of the company;	Total	Local	Int'l
Democratic and collaborative environment	15	5	10
Autocratic approach	7	6	1

After the evaluation of the results of the nominal questions, it is seen that the interviewees reach at a consensus of most of the questions. The question regarding the strategic decision-making approach of the company created conflict between the interviewees and the responses of local and international companies differentiate. Therefore, strategic decision-making approach factor has been included in the SWOT tables as the last external factor.

5.1.3. Distribution of Rating Levels of Internal Factors

The internal factors affecting the Turkish construction project management sector are selected after an extensive research for the internal strategic analysis in the

literature. According to the proposed conceptual framework of this study, which is explained in the previous chapters, Resource Based View has been utilized in order to determine the factors. The selected factors are explained in details in Chapter 4 of this study.

During the evaluation of the results, the internal factors adopted from 3 different frameworks have been shortlisted according to the responses of the interviewees in order to generate the strength and weakness factors of the SWOT tables. This study has been conducted for all interviews, the interviews of the local companies and the interviews of the international companies separately in order to create the SWOT tables for all 3 clusters separately and achieve separate strategies accordingly.

5.1.3.1. Evaluation of the Factors adopted from chapters, Resource Based View . Interviewees have been asked to evaluate the 34 internal factors adopted from Resource Based View according to their positive or negative effects to their companies' success. Then they have been requested to grade the importance of each factor as 1 having the least and 5 having the highest importance according to their contribution to their companies' success positively or negatively. The below Table 5.8., Table 5.9. and Table 5.10. show the distribution of the internal factors as evaluated positive or negative by the interviewees as well as their average importance factor values clustered for all results, results collected from local companies and results collected from international construction project management companies separately. As it can be followed from the below Table 5.8., Table 5.9. and Table 5.10., the interviewees has the tendency of rating all of the internal factors as having positive effect to their companies.

The positive ratings vary between 19 and 22 out of 22 responds and do not fall below 19 positive rates. The reason for these positive ratings is asked to the interviewees. They responded that, they are very confident about the capabilities of their companies and the competencies of their colleagues / teams. They claim that they are capable of delivering all kinds of services that can be requested by the employers. It should be considered that all the interviewees and the companies they are representing

are the most reputable and professional project management companies of Turkish construction sector.

As distinct from the below procedures, there is no mostly negative rated factors. Therefore, the factors which are rated as having the highest importance are marked with green and selected as strengths. The factors which are rated as having the least importance are marked with red and selected as the weaknesses. The tables filtered according to the highest importance factors are given in Appendix C.

Table 5.8. Internal Factors Results of All Interviews.

			General			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
T1	Efficiency of Technical Resources	Capability in use of information technologies (IT)	21	1	20	4.05
T2		Innovation capability	22	0	22	3.95
T3		Investment on R&D	19	3	16	3.50
F1	Efficiency of Financial Resources	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	20	2	18	3.41
F2		Financial status of your company	20	2	18	3.64
F3		Financial stability of your company	21	1	20	3.64
H1	Efficiency of Human Resources	Current capacity of human resources	22	0	22	3.86
H2		Development and use of human resources	20	2	18	4.09
H3		Communication and coordination among departments (teamwork)	21	1	20	Apr-14
R1	Efficiency of Relationships	Relationship with clients/ owners	22	0	22	4.32
R2		Relationship with contractors	21	1	20	3.64
R3		Relationship with designers/consultants	22	0	22	3.95
R4		Relationship with government entities	19	3	16	2.91

Table 5.8. Internal Factors Results of All Interviews (cont.).

			General			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
S1	Efficiency of Structural Resources (organizational culture, managerial approach, development of strategies, etc.)	Diversification strategies	22	0	22	3.91
S2		Market selection strategies	19	3	16	3.32
S3		Project selection strategies	22	0	22	3.45
S4		Client selection strategies	21	1	20	3.59
S5		Partner selection strategies	22	0	22	3.23
S6		Bidding strategies	21	1	20	3.55
S7		Service quality management	21	1	20	3.95
S8		Time management	22	0	22	4.09
S9		Cost management	22	0	22	4.14
S10		Health and Safety management	22	0	22	3.32
S11		Environmental management	22	0	22	3.05
S12		Risk management	21	1	20	3.64
S13		Site management	22	0	22	3.59
S14		Claim management	20	2	18	3.64
S15		Contractor management	22	0	22	4.18
S16		Knowledge management	22	0	22	4.05
S17		Knowledge and expertise in the market	22	0	22	4.00
S18		Experience in similar projects	22	0	22	4.23
S19		Flexibility and adaptability of market changes	22	0	22	4.09
S20		Organizational culture/structure (Your company's objectives, visions and missions)	21	1	20	3.77
S21		Your company's brand image and reputation in the market	22	0	22	3.86

Table 5.9. Internal Factors Results of the Interviews with Local Companies.

			Local			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
T1	Efficiency of Technical Resources	Capability in use of information technologies (IT)	10	1	9	4.36
T2		Innovation capability	11	0	11	4.18
T3		Investment on R&D	10	1	9	4.09
F1	Efficiency of Financial Resources	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	9	2	7	3.18
F2		Financial status of your company	9	2	7	3.09
F3		Financial stability of your company	10	1	9	3.18
H1	Efficiency of Human Resources	Current capacity of human resources	11	0	11	3.82
H2		Development and use of human resources	9	2	7	4.18
H3		Communication and coordination among departments (teamwork)	11	0	11	4.27
R1	Efficiency of Relationships	Relationship with clients/owners	11	0	11	4.27
R2		Relationship with contractors	10	1	9	3.55
R3		Relationship with designers/ consultants	11	0	11	3.91
R4		Relationship with government entities	9	2	7	3.00

Table 5.9. Internal Factors Results of the Interviews with Local Companies (cont.).

			General			
			Local			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
S1	Efficiency of	Diversification strategies	11	0	11	4.00
S2	Structural Resources	Market selection strategies	9	2	7	3.18
S3	(organizational culture,	Project selection strategies	11	0	11	3.36
S4	managerial approach,	Client selection strategies	11	0	11	3.64
S5	development of strategies, etc.)	Partner selection strategies	11	0	11	3.36
S6		Bidding strategies	10	1	9	3.55
S7		Service quality management	10	1	9	3.73
S8		Time management	11	0	11	4.00
S9		Cost management	11	0	11	4.09
S10		Health and Safety management	11	0	11	3.00
S11		Environmental management	11	0	11	2.82
S12		Risk management	10	1	9	3.45
S13		Site management	11	0	11	3.36
S14		Claim management	9	2	7	3.36
S15		Contractor management	11	0	11	4.18
S16		Knowledge management	11	0	11	4.18
S17		Knowledge and expertise in the market	11	0	11	4.00
S18		Experience in similar projects	11	0	11	4.27
S19		Flexibility and adaptability of market changes	11	0	11	4.36
S20		Organizational culture/structure (Your company's objectives, visions and missions)	10	1	9	3.73
S21		Your company's brand image and reputation in the market	11	0	11	3.73

Table 5.10. Internal Factors Results of the Interviews with International Companies.

			Int'l			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
T1	Efficiency of Technical Resources	Capability in use of information technologies (IT)	11	0	11	3.73
T2		Innovation capability	11	0	11	3.73
T3		Investment on R&D	9	2	7	2.91
F1	Efficiency of Financial Resources	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	11	0	11	3.64
F2		Financial status of your company	11	0	11	4.18
F3		Financial stability of your company	11	0	11	4.09
H1	Efficiency of Human Resources	Current capacity of human resources	11	0	11	3.91
H2		Development and use of human resources	11	0	11	4.00
H3		Communication and coordination among departments (teamwork)	10	1	9	4.00
R1	Efficiency of Relationships	Relationship with clients/owners	11	0	11	4.36
R2		Relationship with contractors	11	0	11	3.73
R3		Relationship with designers/consultants	11	0	11	4.00
R4		Relationship with government entities	10	1	9	2.82

Table 5.10. Internal Factors Results of the Interviews with International Companies (cont.).

			Int'l			
abb.	category	Factor name	positive	negative	strength / weakness no of (+) - no of (-)	Avg.
S1	Efficiency of Structural Resources (organizational culture, managerial approach, development of strategies, etc.)	Diversification strategies	11	0	11	3.82
S2		Market selection strategies	10	1	9	3.45
S3		Project selection strategies	11	0	11	3.55
S4		Client selection strategies	10	1	9	3.55
S5		Partner selection strategies	11	0	11	3.09
S6		Bidding strategies	11	0	11	3.55
S7		Service quality management	11	0	11	4.18
S8		Time management	11	0	11	4.18
S9		Cost management	11	0	11	4.18
S10		Health and Safety management	11	0	11	3.64
S11		Environmental management	11	0	11	3.27
S12		Risk management	11	0	11	3.82
S13		Site management	11	0	11	3.82
S14		Claim management	11	0	11	3.91
S15		Contractor management	11	0	11	4.18
S16		Knowledge management	11	0	11	3.91
S17		Knowledge and expertise in the market	11	0	11	4.00
S18		Experience in similar projects	11	0	11	4.18
S19		Flexibility and adaptability of market changes	11	0	11	3.82
S20		Organizational culture/structure (Your company's objectives, visions and missions)	11	0	11	3.82
S21		Your company's brand image and reputation in the market	11	0	11	4.00

The highest rated factors, which are mostly evaluated as having positive effects, are selected to be included as opportunity in the SWOT tables. The highest rated factors, which are mostly evaluated as having negative effects, are selected to be included as threat in the SWOT tables. Figure 5.9 indicates the list of strengths and weaknesses adopted from the internal factors to be included in the SWOT tables of the whole interviewees, local companies and international companies.

abb.	Factor name	General		Local		Int'l	
		strength	weakness	strength	weakness	strength	weakness
T1	Capability in use of information technologies (IT)	□	□	✓	□	□	□
T3	Investment on RandD	□	□	□	□	□	✓
F2	Financial status of your company	□	□	□	✓	✓	□
H3	Communication and coordination among departments (teamwork)	✓	□	✓	□	□	□
R1	Relationship with clients/owners	✓	□	✓	□	✓	□
R4	Relationship with government entities	□	✓	□	✓	□	✓
S2	Market selection strategies	□	✓	□	□	□	□
S5	Partner selection strategies	□	✓	□	□	□	✓
S7	Service quality management	□	□	□	□	✓	□
S8	Time management	□	□	□	□	✓	□
S9	Cost management	✓	□	□	□	✓	□
S10	Health and Safety management	□	✓	□	✓	□	□
S11	Environmental management	□	✓	□	✓	□	✓
S15	Contractor management	✓	□	□	□	✓	□
S18	Experience in similar projects	✓	□	✓	□	✓	□
S19	Flexibility and adaptability of market changes	□	□	✓	□	□	□

Figure 5.9. Opportunities and Threats Obtained from the Internal Analysis.

5.1.4. Reliability Testing

Reliability can be defined as the consistency of measurement. The reliability of a data corresponds to the degree of the direct relations of all variables with exclusion of the error terms from structural point of view (Bollen, 1989). The scale reliability is measured by Cronbach's alpha coefficient which indicates the internal consistency of the data.

Cronbach's alpha values are calculated by using SPSS for all three interview categories where the interviewees stated the importance of the factors based on a 1-5 point Likert scale 1 having the least and 5 having the highest effect. The values are given in Table 5.11 below. Since all values are above 0.70, it is concluded as satisfactory with reference to recommendation made by Nunally (1978). for minimum value.

Table 5.11. Opportunities and Threats Obtained from the Internal Analysis.

Factors	**Cronbach's Alpha Values**
Pestel Factors	0.924
Porter's Five Forces Factors	0.777
Internal Factors	0.930

5.2. SWOT Analysis Tables

In this Section, the SWOT tables are created using the acquired data from the strategic analysis for local project management companies, foreign project management companies and all companies participated the interviews separately. According to the interviewees' responses regarding positive and negative choices and importance ratings, the opportunity and threat factors have been selected from the external analysis and strength and weakness factors have been selected from the internal analysis. The selection of the SWOT factors are explained in details in the previous Section.

After selecting the SWOT factors and creating the SWOT tables, 5 sector professionals have been consulted for the grading of the SWOT tables. Below Table 5.12 indicates the profiles of the 5 experts consulted for grading the SWOT tables.

A group discussion has been conducted with the 3 of the experts (#3, #4 and #5). Then, individual interviews have been conducted with #1 and #2. The feedbacks were conflicted on several items, therefore short 2nd round meetings are conducted in order to obtain the agreed opinions on which all experts achieved a consensus.

Table 5.12. Profiles of the Five Experts.

No. Of Experts	Position	Experience in Construction Sector (years)	Experience in Construction Project Management (years)	Expertise
1	General Manager	15	13	Civil Engineer, MSc
2	Project Director	21	13	Civil Engineer, MBA
3	Partner, Project Executive	13	11	Civil Engineer, MBA
4	MEP Lead	19	7	Mechanical Engineer
5	Managing Partner	23	18	Architect

Figure 5.10 summarizes the SWOT factors obtained from the external and internal analysis for all companies, local companies and international companies separately.

	General		Local		Int'l	
	opportunities	threats	opportunities	threats	opportunities	threats
Government stability and policies	✓		✓	□	□	✓
Elections	□	✓	□	✓	□	✓
Threats to homeland security (terrorism, etc.)	□	✓	□	✓	□	✓
Likely changes in the economy	□	✓	□	✓	□	✓
Job growth in the market	✓		✓	□	✓	□
Inflation and interest rates	□	✓	□	✓	□	✓
Consumer attitudes	✓		✓	□	✓	□
Impact of new technologies and Internet and new software	✓		✓	□	✓	□
The construction permit, occupancy permit etc. procedures	□	✓	□	✓	□	□
The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service	✓		✓	□	✓	□
The degree to which an industry depends on the PM companies for a large percentage of its total sale	✓		□	✓	✓	□
strategic decision-making approach of the company in a Democratic and collaborative environment	✓	□	□	✓	✓	□
	7	5	5	7	6	5

Figure 5.10. SWOT Factors.

	strengths	weaknesses	strengths	weaknesses	strengths	weaknesses
Relationship with clients/owners	✓	□	✓	□	✓	□
Experience in similar projects	✓	□	✓	□	✓	□
Contractor management	✓	□	□	□	✓	□
Communication and coordination among departments (teamwork)	✓	□	✓	□	□	□
Cost management	✓	□	□	□	✓	□
Flexibility and adaptability of market changes	□	□	✓	□	□	□
Capability in use of information technologies (IT)	□	□	✓	□	□	□
Time management	□	□	□	□	✓	□
Service quality management	□	□	□	□	✓	□
Financial status of your company	□	□	□	✓	✓	□
Relationship with government entities	□	✓	□	✓	□	✓
Environmental management	□	✓	□	✓	□	✓
Partner selection strategies	□	✓	□	□	□	✓
Health and Safety management	□	✓	□	✓	□	□
Market selection strategies	□	✓	□	□	□	□
Investment on RandD	□	□	□	□	□	✓
	5	5	5	4	7	4

Figure 5.11. SWOT Factors 1.

After the SWOT tables are created using the selected factors, 5 sector professionals have been consulted while evaluating the SWOT tables. Since the SWOT factors are set, 5 sector professionals have been consulted for the grading of the SWOT tables.

In the OS quadrant, "+" sign is given when the opportunity is achieved by means of a strength that greatly matches that opportunity or a strength is utilized in order to take advantage of that opportunity. In the OW quadrant, "+" sign is used when a weakness is overcome by using an opportunity. On the other hand, "-" sign is used when a weakness disables taking advantage of an opportunity. In the TS quadrant, "+" sign is used when a strength is used to avoid a threat. "-" sign is also used in this quadrant when a strength is eliminated because of a threat. In the TW quadrant, "-" sign is used when a weakness worsens the consequences of a threat or when a threat becomes more critical for a company when having a specific weakness. The sign "0" is used in all quadrants when the corresponding internal factor and external factor do not match, do not interact and do not have any impact on each other. Below Table 5.13, Table 5.14 and Table 5.15 presents the SWOT tables created and graded for all companies, local companies and international companies separately.

Table 5.13. SWOT Table for All Companies.

		O1	O2	O3	O4	O5	O6	O7	T1	T2	T3	T4	T5
	SWOT general	Government stability and policies	Job Growth in the market	Consumer attitudes	Impact of new technologies and Internet and new software	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service	The degree to which an industry depends on the PM companies for a large percentage of its total sale	strategic decision-making approach in a Democratic and collaborative environment	Elections	Threats to homeland security (terrorism, etc.)	Likely changes in the economy	Inflation and interest rates	The construction permit, occupancy permit etc. procedures
S1	Relationship with clients/ owners	0	+	+	0	+	+	0	0	0	0	0	+
S2	Experience in similar projects	0	+	0	0	+	+	0	0	0	0	0	0
S3	Contractor management	0	+	+	+	+	0	0	0	0	0	0	-
S4	Communication and coordination among departments (teamwork)	0	+	0	+	0	0	+	0	0	0	0	0
S5	Cost management	0	+	+	+	+	0	0	0	0	+	0	0
W1	Relationship with government entities	+	0	0	0	0	0	0	-	0	0	0	-
W2	Environmental management	0	-	0	0	-	0	0	0	0	0	0	0
W3	Partner selection strategies	0	-	0	0	0	0	+	0	0	0	0	0
W4	Health and Safety management	0	-	0	+	0	0	0	0	0	0	0	0
W5	Market selection strategies	0	-	0	0	0	0	0	0	0	0	0	0

Table 5.14. SWOT Table for Local Companies.

		O1	O2	O3	O4	O5	O6	O7	T1	T2	T3	T4	T5
	SWOT general	Government stability and policies	Job Growth in the market	Consumer attitudes	Impact of new technologies and Internet and new software	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service	The degree to which an industry depends on the PM companies for a large percentage of its total sale	strategic decision-making approach in a Democratic and collaborative environment	Elections	Threats to homeland security (terrorism, etc.)	Likely changes in the economy	Inflation and interest rates	The construction permit, occupancy permit etc. procedures
S1	Relationship with clients/owners	0	+	+	0	+	0	0	0	0	+	+	0
S2	Experience in similar projects	0	+	0	0	+	0	0	0	0	0	0	0
S3	Communication and coordination among departments (teamwork)	0	+	0	+	0	0	0	0	0	+	0	-
S4	Flexibility and adaptability of market changes	+	+	0	0	0	+	+	+	+	0	0	+
S5	Capability in use of information technologies (IT)	0	+	+	+	+	0	0	0	0	0	0	0
W1	Relationship with government entities	+	0	0	0	0	-	0	0	0	-	0	0
W2	Environmental management	0	-	0	0	-	0	0	0	0	0	0	0
W3	Health and Safety management	0	-	0	+	0	0	0	0	0	0	-	0
W4	Financial status of your company	+	+	+	-	0	-	0	-	-	0	-	0

Table 5.15. SWOT Table for International Companies.

		O1	O2	O3	O4	O5	O6	O7	T1	T2	T3	T4	T5
	SWOT general	Government stability and policies	Job Growth in the market	Consumer attitudes	Impact of new technologies and Internet and new software	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service	The degree to which an industry depends on the PM companies for a large percentage of its total sale	strategic decision-making approach in a Democratic and collaborative environment	Elections	Threats to homeland security (terrorism, etc.)	Likely changes in the economy	Inflation and interest rates	The construction permit, occupancy permit etc. procedures
S1	Relationship with clients/owners	+	+	0	+	+	0	0	0	0	0	0	
S2	Experience in similar projects	+	0	0	+	+	0	0	0	0	0	0	
S3	Contractor management	+	+	+	+	0	0	0	0	0	0	0	
S4	Cost management	+	+	+	+	0	0	0	0	0	+	0	
S5	Time management	+	+	+	+	0	0	0	0	0	0	0	
S6	Service quality management	+	+	+	+	0	0	0	0	0	0	0	
S7	Financial status of your company	+	0	0	0	0	0	+	+	0	+	+	
W1	Relationship with government entities	0	0	0	0	0	0	0	-	0	0	0	
W2	Environmental management	-	0	0	-	0	0	0	0	0	0	0	
W3	Partner selection strategies	-	0	0	0	0	+	0	0	0	0	0	
W4	Investment on RandD	0	0	-	0	0	0	0	0	0	0	0	

5.3. Evaluation of the SWOT Tables

The grading of the SWOT tables enables us to create the strategies by using creative participatory techniques such as brain storming and group meetings. The sector professionals who are kindly consulted during the grading of the SWOT tables, have been consulted for evaluation of the graded tables and formulating the strategies.

5.3.1. SWOT Analysis for All Companies

The opportunity of "job growth in the market" is found to be extremely effective on both strengths and weaknesses. It is stated by the interviewees that when there is potential job opportunities in the market, a company may distinguish among other companies by means of its capabilities. Similarly, a company may fall behind other companies because of its weaknesses. It should be noted that most of the grading is discussed considering the competitive environment of the Turkish construction sector, which reveals the importance of the sales strategies of the companies. A competent business development and sales team may bring the strengths of a company forward while covering the weaknesses during the new job interviews. Since the opportunity of "job growth in the market" is graded by the interviewees as one of the most effective external factor, the 1st strategy has been formulated as follows;

- "STR#1: The construction PM companies should give great importance to their business development departments and their sales strategies in order to benefit from the job growth in the market".
  (i) The way forward: The potential job growth increased in the market increases the bargaining power of the Employer teams. Therefore, the Employer teams should establish qualified purchasing teams in the project level, who gets to differentiate the qualified construction project management teams among the insufficient teams. In organization level, the construction project management companies should establish qualified business development teams, who will represent their companies and convince the Employer how they will fulfill the Employers' requirements and add value to the project. In indus-

try level, there should be a grading mechanism run by the government so that the differentiation of the construction project management companies will not only rely on the capabilities of the business development teams of the project management companies and the consciousness of the Employer teams, but also there will be an independent certified grading system for the benefit of the competent construction project management companies.

The capability of "cost management" enables taking advantage of opportunities and eliminating the possible consequences of the external factors. As being one of the three Iron Triangle criteria, cost management is found to be one of the most crucial capabilities. One may wonder if another Iron Triangle criteria is also shortlisted as a strength. The answer is that, the quality management did not enter any of the SWOT tables, while time management can be followed as an effective strength in the SWOT Analysis of the international construction project management companies. The related strategy for the SWOT table of all companies has been formulated as follows;

- "STR#2: The cost management capability of the construction PM companies should be constantly improved by ensuring the technical office competency and following the most advanced software".
  (i) The way forward: In project level, the Employer teams may not and should not be knowledgeable about the cost management tools and softwares to be utilized in a construction project. However, they should be demanding and ask for the cost management software to be utilized in their projects. In organization level, it is a must for the construction project management companies to become prominent with their cost management capabilities. Therefore they should both have capable commercial teams and use most advanced software to ensure the capability of cost management.

The opportunity of "The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service" prevails in the SWOT analysis of all companies as well as in the SWOT tables of local and international companies. The interviewed sector professionals are so confident with

their companies that they see the service differentiation as an opportunity and they claim that their companies are capable of fulfilling any requested specified service. The corresponding strategy can be formulated as follows;

- "STR#3: The service differentiation in the construction project management sector should be utilized by having the qualified staff and using the required tools in order to undertake any requested specified project management services".
  (i) The fay forward: In project level, the Employer should be aware of the service content that their projects require and they should be able to evaluate if a construction project management company is capable to undertake all the requested kinds of services. In the organization level, this strategy is related to the approach of the company. If a construction project management company claims to provide all services of the all knowledge areas, they should improve their teams accordingly with the qualified employees. On the other hand, if a construction project management company prefers to prevail in specific services such as site supervision or contract management, they should concentrate their efforts and resources on this areas.

The opportunity of "Impact of new technologies and Internet and new software" draws the attention in all studied SWOT tables as promoting the strengths. That is an inevitable aspect of the fact that nowadays new technologies and new software are being implemented and utilized in most of the sectors. The corresponding strategy has been formulated as follows;

- "STR#4: New technologies and software should be utilized in all provided services in order to enhance the service quality".
  (i) The way forward: Nowadays, with the effect of developing technology, many construction project management software are introduced in the industry and used in the projects. In project level, the Employer teams should be demanding and ask for the most advanced software to be utilized in their projects. In organization level, the construction project management companies should exploit the most advanced software and have qualified technical

office employees to be able to utilize the new technologies efficiently.

5.3.2. SWOT Analysis for Local Companies

The strategies of STR#1, STR#3 and STR#4 formulated for the SWOT analysis of all companies are valid for the SWOT Analysis for local companies.

The strength of "Flexibility and adaptability of market changes", which is shortlisted only in the SWOT analysis of the local project management companies, has a crucial impact of avoiding most of the political and economic threats in the market. During the interviews, this strength has been observed to be specific to the local project management companies. The political and economic threat factors are shortlisted substantially in all 3 SWOT tables, and yet this strength is one of the two strengths that seems to eliminate the political and economic threat factors in all tables (The other one is "Financial status of your company" strength factor in the SWOT Analysis of international companies, which is explained in the next Section.). The 5th strategy is formulated as follows;

- "STR#5: The local project management companies should develop a flexible approach to the market conditions and be able to adapt the market conditions".
  (i) The way forward: The market conditions may vary in terms of project types, client types, project volumes, the size of available projects in the market, project parties as well as the external economic factors, etc. This strategy is directly related to the organization level, where the organizations should continually conduct market analysis and develop their plans accordingly.

A weakness specific to the local project management companies is "Financial status of your company". During the interviews, it has been clearly seen that the local companies are less confident about their companies" financials than the international companies. The financially weak status of company makes it vulnerable against the political and economic threats in the market as it can be followed from the related SWOT table. However, this weakness can be overcome by several opportunities such

as “Job growth in the market” and “Consumer attitudes”. The related strategy can be formulated as follows;

- “STR#6: The local construction project management companies should utilize the available opportunities in the market in order to enhance their financial status and protect themselves from being vulnerable against the political and economic threats”.
  (i) The way forward: This strategy regarding the financial capability of the company can only be related with the organization level approaches. The local construction project management companies should manage their resources properly, well plan their business development strategies and deployment schedules.

5.3.3. SWOT Analysis for International Companies

The strategies of STR#1, STR#3 and STR#4 formulated for the SWOT analysis of all companies are valid for the SWOT Analysis for international companies.

As distinct from the above analysis, the international construction project management companies have the strength of “Service quality management”, which enables them exploiting many opportunities available in the market. During the interviews, the representatives of the international companies explained that they attach particular importance to their service quality. The service quality is their way of differentiation among other companies despite their relatively high services fees in comparison to the local companies. The related strategy would be as follows;

- “STR#7: The international project management companies should maintain their service quality in Turkish construction sector in order to exploit the opportunities available in the market”.
  (i) “Financial status of your company” factor reveals as a strength in the SWOT analysis of international project management companies. This strength seems to have a great impact on the political and economic threats that

the companies are facing. Also it is the only strength that provides the international project management companies avoiding the threats in the sector. The corresponding strategy has been formulated as follows;

- "STR#8: The international project management companies should maintain their financial strength in Turkish construction sector in order to minimize the political and economic threats".

6. CONCLUSIONS

The extent of construction project management services is not well known in Turkish construction industry. While assigning a 3rd party construction management consultant is a must in most of the countries especially in large scaled projects, this requirement is ignored in Turkey or the construction project management services are undertaken by the designer, contractor or the Employer, which creates conflict of interest.

While most of the design companies and contractors claim to have construction management capabilities, there are very limited number of companies, who are actually specialized in construction project management services. A comprehensive research has been conducted in order to establish a list of foreign and local construction project management companies operational in Turkey. The official websites such as "Association of Turkish Consulting Engineers and Architects" has been covered and sector professionals have been contacted in order to request their records. Finally, a list of thirty two local and international construction project management companies operational in Turkey has been longlisted.

The main objective of this study is to conduct a strategic analysis of the Construction Project Management Companies in Turkey and establish strategies accordingly. First of all, the framework of this study has been constructed. According to the proposed framework, the study begins with the boundary conditions corresponding to the company profile comprising the information such as the origin of the company, the years of experience in Turkish construction sector, approximate headcount and the services provided by the company. The main components of the proposed framework is the external and internal analysis at the company level. For the external analysis, the factors have been adopted from the PESTEL analysis, Porter's Five Forces analysis and Strategic Group Analysis. The internal factors have been adopted from the resource-based view. An interview form has been created using the adopted internal and external factors. 22 face-to-face interviews have been conducted out of 32

longlisted companies, which resulted in approximately 69% response rate.

The results of the interviews allowed us to create a value creation map. In this study, SWOT analysis has been used for the visualization of the internal and external analysis as the value creation map. According to the results of the SWOT analysis, the business strategies are formulated. The strategies are formulated for the local companies, international companies and for the construction project management sector in general separately.

6.1. Summary of the Major Findings

This Section summarizes the strategies formulated from the 3 SWOT tables for the local companies, international companies and for the construction project management sector in general. 8 strategies have been formulated in total. 3 of the strategies are valid for all construction project management companies in Turkish construction sector. 1 the strategies is formulated based on the results of the SWOT analysis of all companies. 2 strategies are specific to the local construction project management companies and 2 strategies are formulated for the international project management companies operational in Turkey. The summary table for the proposed strategies is as follows;

Table 6.1. Proposed Strategies.

#	Strategy Description	General	Local	Int'l
STR#1	The construction PM companies should give great importance to their business development departments and their sales strategies in order to benefit from the job growth in the market.	x	x	x
STR#2	The cost management capability of the construction PM companies should be constantly improved by ensuring the technical office competency and following recent software strictly.	x		
STR#3	The service differentiation in the construction project management sector should be utilized by having the qualified staff and using the required tools in order to undertake any requested specified project management services.	x	x	x

Table 6.1. Proposed Strategies (cont.).

#	Strategy Description	General	Local	Int'l
STR#4	New technologies and software should be utilized in all provided services in order to enhance the service quality.	x	x	x
STR#5	The local project management companies should develop a flexible approach to the market conditions and be able to adapt the market conditions.		ü	
STR#6	The local construction project management companies should utilize the available opportunities in the market in order to enhance their financial status and protect themselves from being vulnerable against the political and economic threats.		x	
STR#7	The international project management companies should maintain their service quality in Turkish construction sector in order to exploit the opportunities available in the market.			x
STR#8	The international project management companies should maintain their financial strength in Turkish construction sector in order to minimize the political and economic threats.			x

In this study, semi-structured interviews have been conducted with the 22 sector professionals. The face-to-face interviews enabled us being able to receive the feedbacks of the interviewees instantly, receiving their direct comments and opinions on the discussed factors and receiving their further recommendations. At the end of each interview, the interviewee is asked to state the major issues that require improvement in the Turkish construction sector. Most of the items commented by the interviewees separately from the agenda are not included in the interview agenda or some of them are superficially mentioned. With respect to the wide experiences of the interviewees participated in this survey, the major issues commented by them are listed below;

- Most of the interviewees stated that there should be a regulations in force explaining the required scope of construction project management services especially for the better understanding and awareness of the Employers. Some of the interviewees claimed that the construction project management services should be compulsory by law in all construction projects. The interviewees commented

that the lack of regulations should be discussed in details in such a study being conducted for the Turkish construction industry.

- Similarly, most of the interviewees stated that there should be PM services rating system by law for all PM companies operational in Turkey. Or they request to have a PM services standards services fee limitations to be followed (Similar to HOAI of Germany, Official Fee Scale for Services by Architects and Engineers). Otherwise, they complain the unqualified companies bear the market prices and create a bad reputation for the PM companies by providing inadequate services.
- Some of the interviewees of local companies suggested that the government should improve support strategies for the local construction project management companies to be able to undertake PM / CM services in abroad construction projects such as promotion, assurance, immunity from taxation, financial support, etc. The interviewees claimed that the construction sector is not stable in Turkey and it is hard to maintain their continuity of business. They find it more and more difficult to compete with the international companies.
- Some of the interviewees claimed that it is difficult to find qualified employees. According to them, the main reason is that the PM / CM master programs are not sufficient except a few universities in Turkey.
- Most of the interviewees agree that the PM Company should be assigned in the early phase of the project and be on duty until the close-out stage. However in Turkey, most of the time the PM Company is employed only when there is a major problem and for a limited scope of services such as site supervision, tender management, etc. Also, most of the participants emphasized the importance of contract management and complain how it is neglected in Turkish construction sector.
- Almost all of the interviewees complained about the unconsciousness of the Employers about the construction project management services, so that most of the Employers are not capable of defining the services they require and evaluating the competence of the PM companies.

6.2. Limitations of the Study and Recommendations for Future Work

There are a number of limitations in this study. Some of them are caused by the research methodology applied and some of them are caused by the interview content. Some limitations are realized and emphasized by the interviewees during the interviews.

The limitations of the study are listed as below;

- All the interviewees and the companies they are representing are the most reputable and professional project management companies of Turkish construction sector. Therefore, they rated all the internal factors as positive claiming that they are capable of delivering all kinds of services that can be requested by the employers. So there is no negative rated internal factor as the result of the interviews, while the positive ratings vary between 19 and 22 out of 22 responds and do not fall below 19 positive rates. Therefore the weakness factors are actually less strong factors of the companies.
- The frameworks utilized in the study which are PESTEL analysis, Porter's Five Forces analysis, Strategic Group Analysis and resource-based view are often used to analyze the construction sector however rarely utilized for the construction project management sector analysis in local and international publishes. Therefore, the adopted factors are commented as being very generic by the interviewees.
- There are many local factors that affect the construction project management practices in Turkey such as the recent regulations regarding the urban transformation and "imar barışı". Since these factors cannot be based on any of the utilized frameworks, they cannot be included to the content of the interviews.
- The SWOT analysis has by definition a general perspective as an approach and offers general solutions for the time period that the study is conducted. The construction industry is a very dynamic sector by nature therefore, the study has to be re-applied in the future according to the possible changes in the sector.
- Similarly, most of the data utilized in order to generate the factors are obtained from the annual reviews, outlook reports and most recent reports. Since the reports and reviews are yearly updated, the study also has to be at least yearly

updated in order to achieve the actual analysis.

- The design management is an importance of the construction project management practice in Turkey. Since the knowledge areas adopted from Construction Extension to PMBOK (2016). do not include design management, design management aspect is not included to the content of the study and the interviews.

In this study, a strategic analysis is conducted for the Construction Project Management Sector in Turkey and strategies have been established accordingly. The data of the study has been acquired from the interviews conducted with the high level sector professionals of reputable construction project management companies. In the future, the study may be extended including interviews with different parties participating a construction project such as Employer, designer, contractor, consultant, building audit teams, etc. The input of the aforementioned parties regarding the construction project management practices will be very beneficial to widen the study's scope.

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APPENDIX A: A SAMPLE OF THE INTERVIEW FORM

Name: _____

Title: _____

Profession: _____

Please state your years of experience in construction sector: _____

(____ years in Contractor, ____ years in Employer, ____ years in Project Management)

Please state the name of the company: _____

Your company is;

[__] a local company operational in Turkey.
[__] a foreign company operational in Turkey.

Please state the years of experience of your company in Turkey: ___

Please state the approximate headcount of your company: ___

1. Which of the below listed Project Management knowledge areas does your company provide as services in Turkey?

[__] Project Integration Management
[__] Project Scope Management
[__] Project Schedule Management
[__] Project Cost Management
[__] Project Quality Management
[__] Project Resource Management
[__] Project Communication Management
[__] Project Risk Management
[__] Project Procurement Management
[__] Project Stakeholder Management
[__] Project Health, Safety, Security and Environmental Management
[__] Project Financial Management

Figure A.1. A Sample of the Interview Form 1.

2. Please evaluate the below listed external factors according to their positive or negative effects to your company's success. To what extent do the following factors contribute to your company positively or negatively (1 having the least and 5 having the highest effect).

Please feel free to add any additional factor that you think contributes to your company positively or negatively to the end of the list.

Table A.1. A Sample of the Interview Form 1.

			positive	negative		Importance				
						1	2	3	4	5
1	Government stability and policies									
2	Tax policy and trade controls									
3	Elections									
4	Threats to homeland security (terrorism, etc.)									
5	Likely changes in the economy									
6	International trend									
7	Job growth in the market									
8	Inflation and interest rates									
9	Unemployment and labor supply									
10	Levels of disposable income across economy and income distribution									
11	Health, education and social mobility of the population									
12	Consumer attitudes									
13	Advertising and media									
14	National and regional culture									
15	Impact of new technologies									
16	Internet and new software									
17	Local environmental issues									
18	Local waste disposal and material transfer procedures									
19	Local legislations									
20	Employment low									
21	Regulatory bodies in Turkey									
22	The construction permit, occupancy permit etc. procedures									
23	Health & Safety Requirements									
24	Other:									

3. Please evaluate the below listed factors according to their extent in positive / negative contribution to your company (1 having the least and 5 having the highest effect).

Table A.2. A Sample of the Interview Form 2.

			Importance				
			1	2	3	4	5
1	The degree of the relative cost advantages of established companies associated with large volumes of scale economies in comparison to new entrants						
2	The degree to which government encourages new entrants to entering the market						
3	The degree to which an industry depends on Employer for a large percentage of its total purchases						
4	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies						
5	The degree to which an industry depends on the PM companies for a large percentage of its total sale						
6	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service						
7	The number of existing substitute PM companies in the industry as a competitive factor						
8	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor						
9	The difference between capacity of PM companies and demand of the Employers						

4. Please state the differentiation strategy of your company:

a- Price differentiation

b- Quality differentiation

5. Please state the diversification strategy of your company:

a- Only the specific scopes of construction PM services in construction sector (such as contract management, QA/QC, etc.)

b- Only construction / construction related sectors

c- Diversified in sectors unrelated to construction

6. Please state the approximate ratio of foreign and local investors of the projects in Turkey that your company has previously worked / is currently working with.

   (___ % local investor, ___ % foreign investor.)

7. Please state which project type has the highest percentage in total numbers of projects within the projects that your company has previously completed / is currently undertaking.
   a- Infrastructure
   b- Transportation
   c- Superstructure (residence, mall, hotel)
   d- Industrial
   e- Water structures

8. Please state which client type has the highest percentage in total number of projects that your company has previously worked / is currently working.
   a- Government
   b- Private Sector

9. Please state the strategic planning approach of your company;
   a- Systematic and regular strategic planning
   b- No systematic approach for strategic planning

10. Please state the strategic decision-making approach of your company;
    a- Democratic and collaborative environment
    b- Autocratic approach

11. Please evaluate the below listed internal factors according to their positive or negative effects to your company's success. To what extent do the following factors contribute to the success or failure of your company? (1 having the least and 5 having the highest effect)

Figure A.2. A Sample of the Interview Form 1.

Table A.3. A Sample of the Interview Form 2.

		positive	negative	Importance				
				1	2	3	4	5
Efficiency of Technical Resources	Capability in use of information technologies (IT)							
	Innovation capability							
	Investment on R&D							
Efficiency of Financial Resources	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)							
	Financial status of your company							
	Financial stability of your company							
Efficiency of Human Resources	Current capacity of human resources Development and use of human resources							
	Communication and coordination among departments (teamwork)							
Efficiency of Relationships	Relationship with clients/owners							
	Relationship with contractors							
	Relationship with designers/consultants							
	Relationship with government entities							

Table A.4. A Sample of the Interview Form 3.

		positive	negative	Importance				
				1	2	3	4	5
Efficiency of Structural Resources (organizational culture, managerial approach, development of strategies, etc.)	Diversification strategies							
	Market selection strategies							
	Project selection strategies							
	Client selection strategies							
	Partner selection strategies							
	Bidding strategies							
	Service quality management							
	Time management							
	Cost management							
	Health and Safety management							
	Environmental management							
	Risk management							
	Site management							
	Claim management							
	Contractor management							
	Knowledge management							
	Knowledge and expertise in the market							
	Experience in similar projects							
	Flexibility and adaptability of market changes							
	Organizational culture/structure (Your company's objectives, visions and missions)							
	Your company's brand image and reputation in the market							

13. According your opinion, what are the major issues that require improvement of the project management companies in Turkish construction industry? Please feel free to add your recommendations as well.

APPENDIX B: DESCRIPTIVE STATISTICS

Table B.1. Descriptive statistics of General Information.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Years of experience in construction sector	22	37.00	10.00	47.00	21.64	1.75	8.20	1.41
Years of experience in Contractor	22	19.00	0.00	19.00	7.27	1.21	5.66	0.57
Years of experience in Employer	21	13.00	0.00	13.00	2.5	0.72	3.28	2.29
Years of experience in PM Company	22	26.00	2.00	28.00	12.09	1.43	6.70	0.53
Company's years of experience in Turkey	22	38.00	3.00	41.00	17.09	2.01	9.41	0.87
The approximate headcount of the company	22	347.00	3.00	350.00	92.18	22.77	106.80	1.44

Table B.2. Descriptive statistics of Pestel Factors.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
P1	22	2.00	3.00	5.00	4.05	0.18	0.84	-0.09
P2	22	4.00	1.00	5.00	3.23	0.22	1.02	0.09
P3	22	4.00	1.00	5.00	3.68	0.27	1.29	-0.81
P4	22	4.00	1.00	5.00	3.77	0.25	1.15	-0.75
P5	22	4.00	1.00	5.00	3.73	0.24	1.12	-0.74
P6	22	4.00	1.00	5.00	3.09	0.22	1.02	-0.20
P7	22	3.00	2.00	5.00	3.77	0.20	0.92	-0.30
P8	22	4.00	1.00	5.00	3.68	0.30	1.43	-0.68
P9	22	4.00	1.00	5.00	2.59	0.25	1.18	0.52
P10	22	4.00	1.00	5.00	3.18	0.27	1.26	-0.22
P11	22	4.00	1.00	5.00	2.91	0.25	1.19	0.00
P12	22	3.00	2.00	5.00	4.00	0.22	102	-0.29
P13	22	4.00	1.00	5.00	3.14	0.20	0.94	0.08
P14	22	3.00	2.00	5.00	3.23	0.20	0.92	0.30
P15	22	3.00	2.00	5.00	3.73	0.22	1.03	-0.25
P16	22	3.00	2.00	5.00	3.73	0.22	1.03	0.04
P17	22	4.00	1.00	5.00	3.09	0.23	1.06	0.32
P18	22	4.00	1.00	5.00	3.00	0.24	1.11	0.00
P19	22	4.00	1.00	5.00	2.91	0.22	1.02	0.49
P20	22	4.00	1.00	5.00	2.95	0.23	1.09	0.34
P21	22	4.00	1.00	5.00	3.09	0.25	1.15	0.01
P22	22	4.00	1.00	5.00	3.36	0.28	1.29	-0.32
P23	22	3.00	2.00	5.00	3.27	0.22	1.03	0.25

Table B.3. Descriptive statistics of Porter's Five Forces Factors.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
P5F-1	22	3.00	2.00	5.00	3.36	0.20	0.95	-0.11
P5F-2	22	4.00	1.00	5.00	3.18	0.24	1.14	0.04
P5F-3	22	3.00	2.00	5.00	3.68	0.14	0.65	-0.76
P5F-4	22	4.00	1.00	5.00	3.55	0.21	0.96	-0.67
P5F-5	22	2.00	3.00	5.00	3.86	0.17	0.77	0.25
P5F-6	22	3.00	2.00	5.00	3.86	0.21	0.99	-0.03
P5F-7	22	4.00	1.00	5.00	3.36	0.22	1.03	-0.01
P5F-8	22	3.00	2.00	5.00	3.59	0.19	0.91	0.12
P5F-9	22	3.00	1.00	4.00	3.00	0.17	0.82	-0.58

Table B.4. Descriptive statistics of Internal Factors.

	N	Range	Minimum	Maximum	Mean		Std. Deviation	Skewness
	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
I1	22	4.00	1.00	5.00	4.05	0.23	1.09	-1.07
I2	22	3.00	2.00	5.00	3.95	0.20	0.95	-0.27
I3	22	4.00	1.00	5.00	3.50	0.27	1.26	-0.16
I4	22	4.00	1.00	5.00	3.41	0.28	1.33	-0.58
I5	22	3.00	2.00	5.00	3.64	0.24	1.14	-0.26
I6	22	3.00	2.00	5.00	3.64	0.22	1.05	-0.26
I7	22	3.00	2.00	5.00	3.86	0.18	0.83	-0.81
I8	22	3.00	2.00	5.00	4.09	0.16	0.75	-0.90
I9	22	2.00	3.00	5.00	4.14	0.17	0.77	-0.25
I10	22	2.00	3.00	5.00	4.32	0.14	0.65	-0.40
I11	22	4.00	1.00	5.00	3.64	0.17	0.79	-1.77
I12	22	2.00	3.00	5.00	3.95	0.14	0.65	0.04
I13	22	3.00	1.00	4.00	2.91	0.20	0.92	-0.61
I14	22	2.00	3.00	5.00	3.91	0.16	0.75	0.15
I15	22	4.00	1.00	5.00	3.32	0.18	0.84	-0.69
I16	22	3.00	2.00	5.00	3.45	0.16	0.74	0.56
I17	22	3.00	2.00	5.00	3.59	0.18	0.85	0.45
I18	22	3.00	2.00	5.00	3.23	0.16	0.75	0.33
I19	22	3.00	2.00	5.00	3.55	0.17	0.80	0.45
I20	22	2.00	3.00	5.00	3.95	0.17	0.79	0.08
I21	22	2.00	3.00	5.00	4.09	0.16	0.75	-0.15
I22	22	2.00	3.00	5.00	4.14	0.15	0.71	-0.20
I23	22	3.00	2.00	5.00	3.32	0.17	0.78	0.67
I24	22	3.00	2.00	5.00	3.05	0.19	0.90	0.77
I25	22	4.00	1.00	5.00	3.64	0.19	0.90	-0.88
I26	22	4.00	1.00	5.00	3.59	0.25	1.18	-0.43
I27	22	4.00	1.00	5.00	3.64	0.20	0.95	-0.61
I28	22	2.00	3.00	5.00	4.18	0.16	0.73	-0.30
I29	22	2.00	3.00	5.00	4.05	0.14	0.65	-0.04
I30	22	3.00	2.00	5.00	4.00	0.23	1.06	-0.77
I31	22	3.00	2.00	5.00	4.23	0.20	0.92	-1.30
I32	22	2.00	3.00	5.00	4.09	0.19	0.87	-0.19
I33	22	2.00	3.00	5.00	3.77	0.17	0.81	0.46
I34	22	3.00	2.00	5.00	3.86	0.17	0.77	-0.43

APPENDIX C: DESCRIPTIVE STATISTICS

Table C.1. Pestel Factors Results of All Interviews Filtered According to Importance Weight.

		General			
abb.	Factor name	positive	negative	irrelevant	average
P1	Government stability and policies	12	10	0	4.05
S2	Consumer attitudes	14	7	1	4.00
P4	Threats to homeland security (terrorism, etc.)	0	21	1	3.77
E3	Job growth in the market	14	7	1	3.77
E1	Likely changes in the economy	5	16	0	3.73
T1	Impact of new technologies	22	0	0	3.73
T2	Internet and new software	21	0	1	3.73
P3	Elections	0	19	3	3.68
E4	Inflation and interest rates	1	20	1	3.68
L4	The construction permit, occupancy permit etc. procedures	8	14	0	3.36
L5	Health & Safety Requirements	22	0	0	3.27
P2	Tax policy and trade controls	9	9	4	3.23
S4	National and regional culture	11	9	2	3.23
E6	Levels of disposable income across economy and income distribution	11	9	2	3.18
S3	Advertising and media	17	0	5	3.14
E2	International trends	14	4	4	3.09
E1	Local environmental issues	17	2	3	3.09
L3	Regulatory bodies in Turkey	18	4	0	3.09
E2	Local waste disposal and material transfer procedures	14	6	2	3.00
L2	Employment low	16	2	4	2.95
S1	Health, education and social mobility of the population	11	7	4	2.91
L1	Local legislations	12	8	2	2.91
E5	Unemployment and labor supply	8	13	1	2.59

Table C.2. Pestel Factors Results of the Interviews with Local Companies Filtered According to Importance Weight.

		Local			
abb.	Factor name	positive	negative	irrelevant	average
S2	Consumer attitudes	7	4	0	4.36
P1	Government stability and policies	7	4	0	4.18
E3	Job growth in the market	8	2	1	4.09
E1	Likely changes in the economy	2	8	0	3.91
P3	Elections	0	10	1	3.91
P4	Threats to homeland security (terrorism, etc.)	0	10	1	3.82
T1	Impact of new technologies	11	0	0	3.82
E4	Inflation and interest rates	1	10	0	3.82
T2	Internet and new software	10	0	1	3.73
L4	The construction permit , occupancy permit etc. procedures	3	8	0	3.73
L5	Health & Safety Requirements	11	0	0	3.45
S4	National and regional culture	3	7	1	3.45
L3	Regulatory bodies in Turkey	10	1	0	3.27
E2	Local waste disposal and material transfer procedures	6	3	2	3.27
S1	Health, education and social mobility of the population	8	1	2	3.27
P2	Tax policy and trade controls	5	4	2	3.18
S3	Advertising and media	8	0	3	3.18
E1	Local environmental issues	7	1	3	3.09
E6	Levels of disposable income across economy and income distribution	6	4	1	3.00
L2	Employment low	9	0	2	3.00
E2	International trends	7	1	3	2.91
L1	Local legislations	7	3	1	2.82
E5	Unemployment and labor supply	6	5	0	2.55

Table C.3. Pestel Factors Results of the Interviews with International Companies Filtered According to Importance Weight

		Int'l				
abb.	Factor name	positive	negative	irrelevant	opportunity / treat no of (+) - no of (-)	average
P1	Government stability and policies	5	6	0	-1	3.91
P4	Threats to homeland security (terrorism, etc.)	0	11	0	-11	3.73
T2	Internet and new software	11	0	0	11	3.73
S2	Consumer attitudes	7	3	1	4	3.64
T1	Impact of new technologies	11	0	0	11	3.64
E1	Likely changes in the economy	3	8	0	-5	3.55
E4	Inflation and interest rates	0	10	1	-10	3.55
E3	Job growth in the market	6	5	0	1	3.45
P3	Elections	0	9	2	-9	3.45
E6	Levels of disposable income across economy and income distribution	5	5	1	0	3.36
P2	Tax policy and trade controls	4	5	2	-1	3.27
E2	International trends	7	3	1	4	3.27
L5	Health & Safety Requirements	11	0	0	11	3.09
S3	Advertising and media	9	0	2	9	3.09
E1	Local environmental issues	10	1	0	9	3.09
L4	The construction permit, occupancy permit etc. procedures	5	6	0	-1	3.00
S4	National and regional culture	8	2	1	6	3.00
L1	Local legislations	5	5	1	0	3.00
L3	Regulatory bodies in Turkey	8	3	0	5	2.91
L2	Employment low	7	2	2	5	2.91
E2	Local waste disposal and material transfer procedures	8	3	0	5	2.73
E5	Unemployment and labor supply	2	8	1	-6	2.64
S1	Health, education and social mobility of the population	3	6	2	-3	2.55

Table C.4. Porter's Five Forces Statements Results of All Interviews Filtered According to Importance Weight.

		General		
#	Statement	positive	negative	average
P3.1	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	14	8	3.86
P3.2	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service.	19	3	3.86
P2.1	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	14	8	3.68
P5.1	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	12	10	3.59
P2.2	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	13	9	3.55
P1.1	The degree of the relative cost advantages of established companies associated with large volumes of scale economies.	11	11	3.36
P4.1	The number of existing substitute PM companies in the industry as a competitive factor	12	10	3.36
P1.2	The degree to which government encourages new entrants to entering the market.	7	15	3.18
P5.2	The difference between capacity of PM companies and demand of the Employers	13	9	3.00

Table C.5. Porter's Five Forces Statements Results of the Interviews with Local Companies According to Importance Weight

		Local		
#	Statement	positive	negative	average
P3.1	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	4	7	3.91
P3.2	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service.	9	2	3.91
P2.1	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	4	7	3.73
P5.1	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	4	7	3.73
P2.2	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	9	2	3.45
P1.1	The degree of the relative cost advantages of established companies associated with large volumes of scale economies.	5	6	3.45
P4.1	The number of existing substitute PM companies in the industry as a competitive factor	5	6	3.36
P1.2	The degree to which government encourages new entrants to entering the market.	4	7	3.45
P5.2	The difference between capacity of PM companies and demand of the Employers	7	4	2.73

Table C.6. Porter's Five Forces Statements Results of the Interviews with International Companies According to Importance Weight.

		Int'l		
#	Statement	positive	negative	avarage
P3.1	The degree to which an industry depends on the buyers (Employers) for a large percentage of its total sales.	10	1	3.82
P3.2	The degree to which services of the PM industry are differentiated so that employers cannot find alternative companies for a specific service.	10	1	3.82
P2.1	The degree to which an industry depends on suppliers (PM companies) for a large percentage of its total purchases.	10	1	3.64
P5.1	The degree of differentiation in products/services offered by companies in construction industry as a competitive factor	8	3	3.45
P2.2	The amount of time, energy, and money for companies in the industry to switch from services offered by a PM company to those offered by other companies.	4	7	3.64
P1.1	The degree of the relative cost advantages of established companies associated with large volumes of scale economies.	6	5	3.27
P4.1	The number of existing substitute PM companies in the industry as a competitive factor	7	4	3.36
P1.2	The degree to which government encourages new entrants to entering the market.	3	8	2.91
P5.2	The difference between capacity of PM companies and demand of the Employers	6	5	3.27

Table C.7. Internal Factors Results of All Interviews According to Importance Weight.

		General		
abb.	Factor name	positive	negative	Avg.
R1	Relationship with clients/owners	22	0	4.32
S18	Experience in similar projects	22	0	4.23
S15	Contractor management	22	0	4.18
H3	Communication and coordination among departments (teamwork)	21	1	4.14
S9	Cost management	22	0	4.14
H2	Development and use of human resources	20	2	4.09
S8	Time management	22	0	4.09
S19	Flexibility and adaptability of market changes	22	0	4.09
T1	Capability in use of information technologies (IT)	21	1	4.05
S16	Knowledge management	22	0	4.05
S17	Knowledge and expertise in the market	22	0	4.00
R3	Relationship with designers/consultants	22	0	3.95
S7	Service quality management	21	1	3.95
T2	Innovation capability	22	0	3.95
S1	Diversification strategies	22	0	3.91
H1	Current capacity of human resources	22	0	3.86
S21	Your company's brand image and reputation in the market	22	0	3.86
S20	Organizational culture/structure (Your company's objectives, visions and missions)	21	1	3.77
F2	Financial status of your company	20	2	3.64
F3	Financial stability of your company	21	1	3.64
R2	Relationship with contractors	21	1	3.64
S12	Risk management	21	1	3.64
S14	Claim management	20	2	3.64
S4	Client selection strategies	21	1	3.59
S13	Site management	22	0	3.59
S6	Bidding strategies	21	1	3.55
T3	Investment on R&D	19	3	3.50
S3	Project selection strategies	22	0	3.45
F1	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	20	2	3.41
S2	Market selection strategies	19	3	3.32
S10	Health and Safety management	22	0	3.32
S5	Partner selection strategies	22	0	3.23
S11	Environmental management	22	0	3.05
R4	Relationship with government entities	19	3	2.91

Table C.8. Internal Factors Results of the Interviews with Local Companies According to Importance Weight.

		Local		
abb.	Factor name	positive	negative	Avg.
S19	Flexibility and adaptability of market changes	11	0	4.36
T1	Capability in use of information technologies (IT)	10	1	Apr-36
R1	Relationship with clients/owners	11	0	4.27
S18	Experience in similar projects	11	0	4.27
H3	Communication and coordination among departments (teamwork)	11	0	4.27
S15	Contractor management	11	0	4.18
H2	Development and use of human resources	9	2	4.18
S16	Knowledge management	11	0	4.18
T2	Innovation capability	11	0	4.18
S9	Cost management	11	0	4.09
T3	Investment on R&D	10	1	4.09
S8	Time management	11	0	4.00
S17	Knowledge and expertise in the market	11	0	4.00
S1	Diversification strategies	11	0	4.00
R3	Relationship with designers /consultants	11	0	3.91
H1	Current capacity of human resources	11	0	3.82
S7	Service quality management	10	1	3.73
S21	Your company's brand image and reputation in the market	11	0	3.73
S20	Organizational culture/structure (Your company's objectives visions and missions)	10	1	3.73
S4	Client selection strategies	11	0	3.64
R2	Relationship with contractors	10	1	3.55
S6	Bidding strategies	10	1	3.55
S12	Risk management	10	1	3.45
S14	Claim management	9	2	3.36
S13	Site management	11	0	3.36
S3	Project selection strategies	11	0	3.36
S5	Partner selection strategies	11	0	3.36
F3	Financial stability of your company	10	1	3.18
F1	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	9	2	3.18
S2	Market selection strategies	9	2	3.18
F2	Financial status of your company	9	2	3.09
S10	Health and Safety management	11	0	3.00
R4	Relationship with government entities	9	2	3.00
S11	Environmental management	11	0	2.82

Table C.9. Internal Factors Results of the Interviews with International Companies According to Importance Weight.

		Int'l		
abb.	Factor name	positive	negative	Avg.
R1	Relationship with clients/owners	11	0	4.36
S18	Experience in similar projects	11	0	4.18
S15	Contractor management	11	0	4.18
S9	Cost management	11	0	4.18
S8	Time management	11	0	4.18
S7	Service quality management	11	0	4.18
F2	Financial status of your company	11	0	4.18
F3	Financial stability of your company	11	0	4.09
H3	Communication and coordination among departments (teamwork)	10	1	4.00
H2	Development and use of human resources	11	0	4.00
S17	Knowledge and expertise in the market	11	0	4.00
R3	Relationship with designers/consultants	11	0	4.00
S21	Your company's brand image and reputation in the market	11	0	4.00
S16	Knowledge management	11	0	3.91
H1	Current capacity of human resources	11	0	3.91
S14	Claim management	11	0	3.91
S19	Flexibility and adaptability of market changes	11	0	Mar-82
S1	Diversification strategies	11	0	3.82
S20	Organizational culture/structure (Your company's objectives, visions and missions)	11	0	3.82
S12	Risk management	11	0	3.82
S13	Site management	11	0	3.82
T1	Capability in use of information technologies (IT)	11	0	3.73
T2	Innovation capability	11	0	3.73
R2	Relationship with contractors	11	0	3.73
F1	Credibility of your company (Creditability grade certificated by relevant bodies, annual value of loans obtained, etc.)	11	0	3.64
S10	Health and Safety management	11	0	3.64
S4	Client selection strategies	10	1	3.55
S6	Bidding strategies	11	0	3.55
S3	Project selection strategies	11	0	3.55
S2	Market selection strategies	10	1	3.45
S11	Environmental management	11	0	3.27
S5	Partner selection strategies	11	0	3.09
T3	Investment on R&D	9	2	2.91
R4	Relationship with government entities	10	1	2.82