

**KAUNAS UNIVERSITY OF TECHNOLOGY
SCHOOL OF ECONOMICS AND BUSINESS**

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**PROJECT COSTING IN PROJECT MANAGEMENT: SERVICE SECTOR
CASE**

MASTER THESIS

Supervisor Lecturer Vitalija Venckuvienė

Kaunas, 2018

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Project Management (621N24002)

MASTER THESIS

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**“PROJECT COSTING IN PROJECT MANAGEMENT: SERVICE SECTOR CASE”
DECLARATION OF ACADEMIC INTEGRITY**

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Kaunas

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Azadi Firat, Kaya. Project Costing in Project Management: Service Sector Case Final Master's Thesis in Project Management / supervisor lecturer Vitalija Venckuvienė. The School of Economics and Business, Kaunas University of Technology.

Social Science: 03S Management and Administration

Key words: *project cost management, project management, management*

Kaunas, 2018. 64 p.

SANTRAUKA

Projekto išlaidų valdymas yra projekto valdymo žinių srities padalinys, kuris leidžia įmonėms teikti paslaugas ir klientų pageidaujamas savybes nuo projekto pradžios iki pabaigos per nustatytą biudžetą ir laikotarpį, kad būtų galima priimti tikslesnius sprendimus, atsižvelgiant į daugiau tikslūs sąnaudų skaičiavimai ir nuolatinis sąnaudų elementų pokyčių stebėjimas. Įmonės stengiasi pasiekti sąnaudų, kokybės, laiko ir apimtys tikslus, efektyviai valdydamos projektų sąnaudas.

Tyrimo lokalizacijos paslaugų sektorius, kurio bendros gamybos sąnaudos yra didelis, pasirinktas kaip projekto išlaidų valdymo taikymo sritis. Šioje pramonės šakoje yra šių išlaidų paskirstymo problema, daugiausia paslaugų sektorius, kuriame didžioji išlaidų dalis nustatoma ankstyvame projekto rengimo etape ir yra išlaidų kontrolės sunkumų. Šiame kontekste buvo surengtas susitikimas su UAB "Synergium" vadovais akis į akį, siekiant išsiaiškinti, kokią išlaidų valdymo politiką įmonė turi pagal projektų valdymo praktiką.

Duomenys, gauti tyrimo "UAB Synergium" srityje, aiškiai parodė, kad dažniausiai projekto išlaidos dažniausiai nustatomos iš anksto. Šia prasme klientų lūkesčiai, atrodo, yra svarbūs nustatant, kaip bus suformuluotas projekto biudžetas. Matoma, kad klientų lūkesčiai dėl kokybės turi įtakos projekte naudojamų išteklių rūšiai ir kad klientai šiuo požiūriu nustato savo projekto biudžetą. Taigi daroma išvada, kad klientų lūkesčiai ir susitarimai dėl kainų yra svarbiausi veiksniai, lemianti projekto išlaidų lokalizavimo pramonėje

Pastebima, kad svarbiausi veiksniai, susiję su projekto sąnaudomis susijusiame sektoriuje, yra klientų lūkesčiai, kokybė, kaina ir efektyvumas bei projektų įgyvendinimui reikalingi procesai. Todėl projekto biudžetus nustato klientai pagal savo kokybės standartus ir kaip jie nori imtis problemų, susijusių su projekto etapu. Atrodo, kad susijusios bendrovės projekto išlaidų valdymas yra panašus į veiksmo pagrįstą kaštų apskaičiavimo metodą šiuo atžvilgiu. Taigi galima daryti išvadą, kad projekto išlaidų sąmatas vertimo ir lokalizavimo sektoriuje neturi įtakos pelningumui, nes procesas iš esmės yra iš anksto apibrėžtas ir kainos jau sutartos.

Raktiniai žodžiai: Projekto išlaidų valdymas, projektų valdymas

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INTRODUCTION

With globalization, competition in the markets has intensified, consumer preferences, marketing, production and accounting systems of enterprises have changed. Customer satisfaction in the marketing strategies of these frameworks has come to the forefront and advanced production techniques have started to be used in production systems and it has been the foreground to manage the costs of resources effectively in the accounting systems where the budget is limited, resources are scarce, and time is very valuable. Businesses operating in such an environment have had to efficiently implement and effectively manage their projects to survive and grow. There is a need for an effective project cost management system that allows businesses to obtain more accurate cost results from the start to the end of the project, thus maintaining both the extent and quality level of output within the acceptable period of the project so that they can make more effective decisions and constantly monitor changes in cost elements. Project costing was analyzed by many scientists such as: Uppal, Kul B., Sobotka, Anna and Agata Czarnigowska, Rad, F. Parviz, Kern, Andrea and Carlos T. Formoso and many more.

Today, businesses have a number of purposes, such as producing cost-effective products at competitive prices with effective project cost management, realizing the product within the targeted budget limits, increasing productivity and being customer-focused. All staff working in the business are required to have knowledge and experience in the project cost management process in order to enable them to fulfill these objectives. In this process, the right planning and effective use of resources, appropriate action according to the business time schedule, selection of the costing methods that will give the most appropriate result and suitable for the structure of the operator in the cost estimation, continuous control of planned costs and actual costs, immediate intervention if there is a deviation between these costs is required.

Project cost management consists of estimating, budgeting and controlling costs so that the project can be completed within the approved budget. In the process of estimating the costs of the project, the bid price of the project is calculated. The bid price of the proposal should include the entire life cycle costs of the project and the profit margin of the business. In the next phase of the project budgeting process, budgets must be prepared in accordance with the cost estimates of the project. Project costs, which is the final stage in project cost management, are controlled by means of planned costs and actual cost comparisons. The cost control system used in this phase cannot identify the cause of the problem but shows where to look for the cause of the problem, gives management feedback, and reports any corrective action.

In this study, as part of the project cost management practices mentioned in the literature, project

cost management practices that are realized in the related business in the related activity period will be determined and the reasons and results of the applications will be investigated. On the other hand, project cost management is more difficult for the service sector. Because the calculation of the cost of production of any concrete product is also sometime. Therefore, one of the problems of the work is the discussion of the contents of the cost management within the scope of project management of the enterprises operating in the service sector. In this context, project cost management practices of companies providing localization services will be discussed. When we look at the research done in the literature, it is seen that the studies carried out in the field of project cost management are clustered around businesses and sectors offering a more concrete product. In this sense, the study carries original value by addressing the service sector. On the other hand, no project focused on cost management in the localization sector. In this sense, the study claims that the localization industry is an example of later research on the project cost and quality of the project.

The research is generally looking for answers to the following question:

1. How effective is project costing in service sector industry such as translation and localization industry and what are the factors that influence this process and how much control does the companies have over these factors?

To answer research problem question the research goal was set as follows - to explore the project costing in project management focusing on the service sector case

In order to research the goal, the following objectives were formulated:

Research objectives:

1. Reveal problematic of project costing in project management
2. To explore theoretical background for project costing in project management
3. To construct methodology for project costing in project management: service sector case
4. To research project costing in project management: service sector case

The research will deal with project costing processes and methods in the localization sector around the theoretical framework related to the probing mentioned above. Moreover, the research will try to explore which factors influence the project costing process in localization industry and how much control does the company have over these factors In this context, problems such as which departments are functionalized by UAB Synergium in the localization sector, which factors play a significant role in the project costing phase, which methods of costing work are carried out and their suitability with reality are investigated. On the other hand, in addition to general implications, inferences have been made regarding the management of project costing in the relevant sector, questioned about the specific cost policies of the company and the sector in which the company is

located and what the profitability policies are.

In this study, the factors that are claimed to affect the project costing in project management such as customer expectations, stakeholders, organizational culture, resource costs and employees were researched. Moreover, the effectiveness of project costing on service sector was also researched in order to understand whether a standard costing method could be used for all projects and clients. Lastly, the impact of project costing in service sector on profitability and the effectiveness of the projects was examined.

1. PROJECT COSTING IN PROJECT MANAGEMENT PROBLEM ANALYSIS

While the answers to the above questions are searched in the research, it will be necessary to make use of the theoretical framework that will enable the analysis of the problem to be clarified in relation with the cost management applications in the literature. Here is the literature review of the problem situation:

The cost management system is a long-running cost-improvement process designed to improve cost-optimization processes and the efficiency of covenant services, which means eliminating costs and activities that do not add value to products or services (Sobotka and Czarnigowska, 2007: 377).

The cost management system consists of methods developed to control and plan cost-generating activities in relation to long-term strategies and short-term objectives. Product costs, product profitability, application of cost management strategies and management performance are all designed to communicate with the functions in the value chain (Raiborn and Kinney, 2011: 519).

The information obtained from the cost management system benefits all of the functional areas of the business such as marketing, financial accounting, quality control, research and development, production planning and programming, investment management and production reporting (Raiborn et al., 2003: 45).

The cost management system is to provide information that will help managers to efficiently use resources in the production of products or services that can compete in terms of timing, cost, quality and functionality in the primary world markets (Saban and Erdogan, 2010: 531). This information enables the optimum use of resources in the production of goods or services.

In project cost management, modern accounting methods using Activity Based Costing, Target Costing, Lifetime Costing and Value Analysis are used.

From 1980's onwards there have been major changes in the daily production environment. Technology advances, increased automation in the production environment, the popularity of computer-aided design and production, the more flexible production systems and the more complex production processes have led to an ever-increasing share of overall production costs in total cost. Along with these changes, the competition conditions have changed, and the need for a cost-effective manufacturing system, effective marketing, sales and distribution policies and more accurate cost information has been increased to enable businesses to survive in the industries they operate.

Traditional cost accounting techniques have been inadequate to track and respond to these changes and have not met the need for accurate cost information that businesses need to compete in the global competitive environment. For this reason, some alternative methods have been sought to restore the managerial relationship of cost information for traditional cost accounting methods. One of these alternative methods is the Activity Based Costing method, which recommends replacing traditional cost accounting methods due to the ability to make business processes and activities transparent and visible.

The Activity Based Costing (FTM) method is a cost model that emerged in the mid-1980s that identifies real-time activities that aim to provide managers with accurate information about the cost and profitability of their customers, products, operations and services, using cost drivers to monitor costs and track cost of these activities (Kaplan and Argyris, 1994: 83). This method will be discussed in detail in the next section since it forms the basis of the application model of the thesis work.

Despite the fact that the target costing method was applied for the first time by Japanese automotive company Toyota in the 1960s, in the 1920s Ford business was leading the way to the target costing method. In addition, in 1930, the Volkswagen company in Germany worked on a similar approach to target costing. Especially after the 1970s, companies under the pressure of "oil crisis" and under the excessive cost pressure and lost their competitiveness have entered into new quests, causing the target costing method to come into its present form and starting to use the method widely (Bahşi ve Can, 2001: 50).

According to Kato and Boer (1995), the target cost method is; is a part of a comprehensive strategic profit management system that focuses on reducing the life-cycle costs of new products while at the same time improving their quality and reliability. According to Monden and Hamada (1991), the target cost method is; is used as a cost reduction system during the design and development phase of a new product or a change of some or all of the existing product. Businesses use this method to achieve their goals such as reducing product costs, ensuring customer satisfaction, managing costs before they occur, and presenting new products to the market at the right time while focusing on profitability.

When the literature is examined, the lifetime costing approach is a process that collects, interprets and analyzes information, applying quantitative tools and techniques without estimating the resources that may be needed in the life cycle of the relevant system. This approach is a powerful technique (NATO, 2009: 1) that supports analytical operations in which managers can make more cost-effective decisions between the different life cycle phases and the options presented to them at different levels of life cycle cost estimation.

Lifetime costing focuses on costs associated with activities that will take place during the lifetime of a product. In this approach, cost data are collected by product, function, activity and cost elements over the years. Expenses such as product development, marketing and distribution expenses related to the accounting period are loaded directly or through an appropriate key to a product (Saban and Erdoğan, 2010: 556).

Life cycle costing is an important approach that alters the entire design, planning and production approach and provides great benefits. Life cycle costing considers asset cost evaluation, initial capital cost and future costs, operating costs, maintenance costs and termination costs throughout the lifetime performance and life cycle. In addition, life cycle costing provides communication between stakeholders and supports stakeholders in developing project design, enabling early evaluation of risk, supporting realistic budget preparation, ensuring the best value, directing negotiations and decisions on material selection (Potts, 2008: 122-123) . In addition to these, the life-cycle costing approach has benefits such as resource selection and evaluation of alternative solutions, management of the current budget, creation of future expenditure profile, assessment of cost reduction opportunities, determination of areas of financial risk and uncertainty, development of the business and analysis of capacity (NATO, 2009: 5).

The lifetime costing approach is a systematic analytic process that evaluates alternative action plans in the project with the aim of choosing the best way to use scarce resources. Alternative forms of life-cycle costing, alternative production methods, alternative support plans, etc. Life cycle costing processes consist of defining the problem (what is the required information), identifying the needs while creating a cost model, obtaining past knowledge-cost relationships, and improving the calculation and test results (Kerzner, 2009: 609).

Lifetime costs constitute the total cost of ownership and acquisition for the life of the project. These costs include research and development, production, operation, support and disposal costs and are briefly described below (Kerzner, 2009: 608-609).

- Research and Development Costs: Cost of feasibility studies, benefit-cost analysis, system analysis, detailed design and development, testing of manufacturing, assembly and engineering models, evaluation and documentation of the starting product, etc.

- Production cost: Improvement of existing production to ensure cost or production of new production tools and equipment, testing of production models, installation and construction costs, operation and maintenance of production power, involvement with internal logistic support requirements, development of test and support equipment, correcting part, development of technical

knowledge, training etc.

- Cost of operation and maintenance: Personnel handling, equipment maintenance, handling and handling, modification of equipment and technical information, etc.

- Cost of Product Retraction and Disposal: The cost of removing the product from the stock due to wear and tear and reevaluation of the next equipment elements.

Kerzner (2009) life cycle cost analysis can be used with cost management methods such as FTM, target costing, value engineering. In particular, the use of the FTM method has made it possible to obtain more realistic information, since it is necessary to monitor the costs of activities taking place within the product life cycle. Moreover, in the design and development stages where 80-90% of the life cycle cost of the product is determined, it will be easier to reach more healthy and meaningful information by using the target costing method.

Value analysis is the creation of a product design strategy that will result in the lowest cost for the product, by identifying the activities that can be removed without lowering the quality and market value of the end products of the business and saving their costs.

Value-creating activities in this approach increase the value of the customer's product or service. Alternatively, activities that do not create value are those that cause a waste of profit, time, resources or money and cause unnecessary costs to be incurred. Non-value creating activity; if any activity is abandoned, the product does not create an activity value if the product does not have a negative effect on customer satisfaction (Saban and Erdoğan, 2010: 532).

The purpose of this approach is to develop a product design strategy that will identify the activities to be lifted without lowering the quality and market value of the products and result in the lowest cost for the specific action or product, The value analysis process depends on a detailed understanding of the needs of the client and the functionality of the output (Rad, 2002: 94).

The value analysis approach involves a number of systematic and logical processes and techniques to increase the value of the project throughout its life cycle. The basic steps of this approach are; to identify the functional requirements of any of the progeny or parts thereof, to identify alternatives, and to explain the value and cost of each alternative without choosing the best value (Potts, 2008: 91-92). This approach refers to the value processes in the initial, planning, implementation and evaluation phases of the project, respectively. Below is Potts (2008: 93-98) briefly describes the application of value approaches in various stages of the project:

- Value planning is applied in the initial phase of the project. Value planning is used during the development of the project summary, in the sense that the value planned at the beginning of the project is available. In this phase, a value criterion is defined and a concept recommendation that satisfies the needs and desires of the customers is presented.

- In the definition phase of the project, value engineering defines the functions necessary to meet the needs of the owners and then compares and analyzes the various options. During this phase, value engineering removes any unnecessary cost from the proposed design. Unnecessary costs are eliminated by defining other options that provide the same functionality at a lower cost. Reasons for unnecessary costs; unnecessary costs due to unnecessary material / parts expenditure, unnecessary costs due to mistakes made in consideration of production contents during design, unnecessary lifetime cost, unnecessary opportunity cost (possible cost of loss of revenue).

- Brain storming meetings are held in the implementation phase of the project, and alternate methods are considered for the same activity. In the following evaluation, the alternative solutions proposed for carrying out the action are analyzed to determine the validity of each. Valid alternatives that are likely to reduce costs at significant levels are included in the proposal.

In this section, the literature on the problem of research is addressed and the current state of the problem is investigated. In this context, the interpretations made about the project costing and the methods of costing are roughly given.

2. THEORETICAL SOLUTIONS

Techniques such as cost, quality, resource, time, and risk management, which are based on the realization of the needs in the projects, management of the costs, resources in a timely manner, quality and productivity, have started to be implemented in the modern world with the development of modern management science. From these techniques, managers are aiming to manage and control cost effectively with cost management technique. In this respect, the enterprises aim to maintain their profitability and assets in an increasingly competitive environment, to use their resources effectively, to increase customer satisfaction and gain superiority to their competitors.

In this part of the study, definition, characteristics, stakeholders, types, success factors, selection and life cycle and project management definition, features, functions, knowledge areas, tools and techniques will be examined. Finally, the project cost management process will be addressed.

2.1. Project Concept

Projects are seen as the struggle for change of societies and this change is increasing rapidly. Businesses in the modern world are effectively and productively implementing and managing change efforts to survive and grow. Thus, businesses operating in a global competitive environment can be successful and survive. The definition of the project is made in many different forms in different sources. Some of these definitions are listed below;

- Within a certain period of time, it is an effort to deliver the product within the defined budget and in accordance with predetermined quality specifications (Gaddis, 1959: 89).
- It is a complex, non-routine, non-recurring initiative with defined time, budget, resource and performance characteristics to meet customer needs (Gray and Larson, 2007: 5).
- Design and engineering applications are a detailed contract or work program that deals with the production of a product or service undertaken to meet a specific customer need or demand (Barutçugil, 2008: 14).
- It is a temporary undertaking undertaken in creating a unique product, service or result (PMI, 2008: 5).
- It is a unique initiative with a specific purpose, multi-functional, interrelated activities that define starting and ending times, consuming budgetary, human and non-human resources (Kerzner, 2009: 2nd).

To develop a new product or service, to make a radical change in the structure of some organization, design or personnel, to develop a new or renewed information system, to build a factory or infrastructure and to implement a new business method or business process (PMI, 2008: 6).

Almost all of the project descriptions focus on the same few key points. These points are; that projects are unique and that they produce new or different things: intent to change, temporary activities, a defined budget, complex and interrelated activities.

The notion of "uniqueness of the project" in project definitions is that it consists of activities that are unique and often not repeated, and that none of the activities is a repeat of another job. Again, the term "transient" means that each project has a defined start and finish date. When the objectives of the project have been achieved and the work has been delivered effectively, the deadline is reached. In addition, the definition of "the project is detailed" means that the characteristics and variables of the output at the beginning of the project are defined clearly (scope, time, cost and quality). Projects are blurred and clear between the two extremes and are located between these extremes according to the level of knowledge. If the characteristics of the project variables and outputs are well defined, the main result will be closer and less detailed. Outputs of more blurred projects will require more detail (Frigenti and Comminos, 2002: 11-13 and PMI, 2008: 5).

In addition to being unique, temporary and elaborate, the projects have the following key features (Webster and Knutson, 2006: 2-3);

- Projects are a complex process that requires joint efforts of people and organizations of different qualities in successive stages from a wide range of fields.
- Projects are made up of a variety of activities carried out using time and money resources to produce a particular product. These interlinked activities are building blocks of the project.
- The project has defined time, cost, resource and quality variables. These variables are very important for project management.
- A project requires the establishment of various organizational structures and the development of different functional relations.
- Projects have a life cycle like organic entities. Projects grow in size after a slow start phase. They then reach a summit, fall, and end.
- Projects are not the same as their products, and the life cycle of the project product involves many projects.

- The project may require a long effort. While many industrial products are produced within short periods of time, expressed in minutes or even minutes, it may take months or years for a project to be completed.

After describing the project description, objectives and characteristics, the following section contains four important constraints that must be stressed in order to successfully complete the project: scope, time, cost and quality will be described.

2.2. Constraints of the project: Scope, Time, Cost and Quality

Scope, time, cost and quality are the most important constraints of project management. While the scope, time and cost constraints form the edges of the project triangle, the quality constraint is at the center of the project triangle and represents the triangle area. The change of any one of these constraints also affects other constraints (Ed, 2010: 39). For example, if we have to cut costs in order to reach the budget target, the scope of the project may have to be narrowed down by reducing the number of hours, number of employees or work done, which may cause the qualification to fall.

Scope, time, cost, and quality, which are four fundamental constraints of the project, are briefly described below (Ed, 2010: 39-41; Gray and Larson, 2007: 92);

Scope: The sum of the products, services and results desired to be realized in the project constitutes the scope of the project. The intent of the scope is to focus on the project plan as clearly as possible for the end user to clearly identify the outputs. The scope of a well-defined project includes some important items. These items are; objectives, constraints, structure of the project, description of the task, type of resource required for each task, estimates, delivery, project change control and approval.

Time: The target time to complete the project is the time of the project. Failure to set the correct time in the projects results in misdetermination of the delivery date, incomplete activities and late reports. Careful identification of the tasks to be performed for accurate forecasting of time requires the determination of the order in which tasks are to be carried out and what human and non-human resources should be allocated for these tasks.

Cost: The sum of all the expenditures required to deliver the project within the defined scope and time is the cost of the project. Badly implemented budget plans cause the funds spent for emergencies to be spent. It is effective to obtain information from similar past projects while budgeting strategies are being established.

Quality: Quality, products or services, which mean conformity to needs, are defined as the realization of the planned objectives of the project and the addition of value to the rights holders. The purpose of the qualification is to deliver project outputs in accordance with the expectations and needs of the project entrepreneurs and to ensure the satisfaction of the stakeholders.

The success of the project depends on the knowledge and skill of the project manager to consider these constraints and to develop plans and processes to keep them in balance. Today, projects are not only completed on time, within scope and in the specified budget, but also needs and expectations of the project stakeholders (project team, project sponsor, project manager etc) need to be met.

2.3. Stakeholders

Project stakeholders are those who are actively involved in the project and are affected either positively or negatively by the development or outcomes of the project. The project manager, project sponsor, project team, consultants, contractors and customers are project stakeholders (Heldman, 2007: 5).

Project Manager: Project managers are those who have the responsibility to plan, organize, implement and control jobs so that customers benefit from the project (Köster, 2009: 7). A project manager should be able to understand the details of the project and manage the project from a broad perspective. The project manager should form the management plan and all relevant component plans; the progress of the project in terms of budget and timeline; define the risk, monitor and do what needs to be done; (PMI, 2008: 26) to provide full and timely reporting of project criteria.

Project Sponsor: A sponsor is a person or a group that provides financial or in-kind financial resources for the project. The task has the authority and responsibility to approve the mission of the purpose and the project, to provide funding and to manage the project processes (Uppal, 2008: 12). The sponsor has significant issues such as approving the changes in the scope, reviewing the ending stages and deciding whether to continue the project when the risk increases (PMI, 2008: 25).

Project Team: Project team; project manager, project management team, and other team members who do the work but do not always participate in the project management. This team of project-related staff consists of different groups with knowledge of specific issues or with a particular set of skills (PMI, 2008: 26). The project team is responsible for developing the project structure and arranging the details of the project, delivering the products on the promised quality, on time and within budget (Caltrans, 2007: 41).

Consultants: Project consultants are long-term actors of developing projects. The consultant's job

is to provide realistic expectations before making large capital expenditures. This task is carried out by engineering and supplier companies in major engineering projects. Engineering and supplier consultants play an important role in project forecasting. They use the estimates of previous projects as references for making new estimates (Mackie, 1984: 53).

Contractors: Project owners are called contractors to individuals or groups who use capital to produce products, services or results in the direction of their will. They aim to maximize profits (Köster, 2009: 7). Seller contractors or procurement contractors provide the components or services necessary for the project on a contractual basis (PMI, 2008: 27).

Customers: The person or organization that will use the product, service or result produced through the project is called the customer. Customers can be internal or external to the organization that performs the project (PMI, 2008: 25). Clients often provide resources for the project (Köster, 2009: 7).

Other Groups: Investors, regulators, society, etc. who have a small role in the development of the project. Parties are.

2.4. Classification of Projects

In general, it is possible to classify projects in a wide variety of forms. These classifications can vary widely depending on the size of the project, the areas of business where the project operates, the work done in the project, and the strategies applied in the project. The types of projects are briefly mentioned below.

Projects in terms of size, large, medium and small-scale projects are divided into three groups. While large projects require detailed scoping plans, smaller projects require simpler planning and less control (Kloppenborg, 2008: 12).

It is also possible to distinguish four groups as construction and chemical engineering projects, production projects, management projects and scientific research projects (Lock, 2007: 5-7).

- Construction or chemical engineering projects; building and construction, soil remediation, excavation, tunnels and bridges, mines, oil and gas, petrochemical plant projects. The most important feature of these projects is the management of the work done from the site.

- Production projects; new product research and development, material production, shipbuilding, automotive, aircraft and rocket, heavy industry, food and beverage, pharmaceuticals. Production projects are usually managed through central offices where laboratories, factories and businesses can

be easily managed.

- Management projects; when a new computer system is developed, when a marketing campaign is initiated, when a feasibility or other study report is organized, when the organization is restructured or when it is hired at any place in the organization.

- Scientific research projects; high-risk, generally non-objective projects that are not predictable for normal project management and require unpredictable outputs.

According to the works done, there are 5 groups, namely projects, commercial projects, R & D and engineering projects, construction and fixed capital investment projects, information systems and management projects and major maintenance projects. Commercial projects: are projects that require engineering activities to meet a specific customer request. The aim of R & D and Engineering projects is to develop new products and production technologies or to make some changes in existing products and technologies. Construction and fixed capital investment projects; land, buildings and machinery, equipment, purchasing, renting or construction work to be carried out. Information systems and management projects; to organize the project carried out by the enterprise, to ensure the communication within the enterprise and to ensure that the management is carrying out its activities efficiently. Major care projects are periodic preventive maintenance and revision projects (Barutçugil, 1988: 237-238).

Projects can also be classified as strategic, system-based and operational projects. Strategic projects are projects such as new product development which last 2-5 years, high level of complexity, affecting the whole of the business. System based projects, 1-2 years of moderate complexity, affecting many parts of the business, projects to deal with contractors instead of workers in the production works. Operational projects are the projects that change the operational procedures in the workplaces, limited to the complex one-effected project with a duration of up to 1 year (Doğruer, 2007: 17).

2.5. Success and Failure Factors of Projects

Project success is the completion of activities within defined time frame, budgeted cost, appropriate performance, customer acceptance, agreed scope without changing the corporate culture and without disturbing the main work flow of the business (Kerzner, 2009: 7). Success depends on the proper sequence and ordering of the activities that make up the project and on effective management and direction of time, materials, people, money, information and similar resources (Barutçugil, 2008: 15).

The success of the project can be assessed in four dimensions: the impact of the project on the

client, management and business success, project activity and preparation for the future (Shenhar et al., 1997: 11-12);

- Impact of the project on the customer; It means meeting the technical, functional and performance requirements of the customer. It also emphasizes the importance of achieving this dimension of success for customers' real needs. The customer's continued use of the same product and returning to buy the new generation of the same product is expressed as a sign of the positive effect of the project on the customer.

- Management and business success; The work done in the project is about whether it can provide the wage, income and expected profit.

- Project effectiveness; The project is financed at the defined budget and at the specified time.

- Preparing for the future; It is to build technical and organizational sub-structures for future developments. It is a long-term perspective, and the question is "what are new opportunities for future products, ideas, innovations and markets," "are new skills and technologies that may be needed in the future investigated," "company surprises in the market and in the technology, challenges to unexpected moves in the competitors, ready to adapt quickly"? answers.

Project success has different meanings for different people. For example, the successes of the project are expenditures which are budgeted in terms of employee satisfaction and accountant in terms of the success of the project, the bonuses according to the management, the profitability according to the partners, the compliance with the rule, the technical ability in terms of an engineer or the aesthetic aspect in terms of an architect or a human resources manager (Kerzner, 2009: 61).

The way to the success of the project is expressed in a very simple formula. This formula (Cagle, 2005: 10);

$$(\text{Knowledge} + \text{Experience} + \text{Character}) * \text{Performance} = \text{Success}$$

Knowledge is the combination of both education and learning. Experience is the application of this information. The character is personality and the behavior of the project against the customers, the manager and the team members. Finally, performance is the satisfaction of the customer and management and the best way to complete the production. The most important of all factors is performance. If the product in the project is not produced according to the expectations of the customers, or if there is no profit at the level of management expectations, the performance will be less than expected and the project will fail.

There are two basic conditions for achieving success in project management. The first is an organizational structure in which management duties, powers and responsibilities are appropriately distributed and the qualities required by the job are distributed. The second basic requirement is an integrated planning and control system in which the objectives and targets to be achieved are determined by mutual agreement, the tasks to be carried out are defined, the plans are based on the necessary and available resources, and the developments are measured in a regular and healthy manner (Barutçugil, 2008: 30).

The key factors for successful implementation of the project are two groups as primary and secondary factors in Table 1.1. The primary factors from these factors are the most basic criteria for a successful project. Secondary factors are those that have fewer prescriptions than primary factors.

Table 2. 1: Project Success Factors

Project Success Factors	
Primary Factors	Secondary Factors
On time Within budget At quality limits Customer accepted	Continue to work with the same customers Using the names of customers as a reference Do not break workflow Institutional change of culture To ensure effectiveness and efficiency in the process Protecting ethical behavior To protect the reputation of the institution

Source: Harold Kerzner (2009); Project Management: A Systems Approach to Planning, Scheduling and Controlling, John Wiley & Sons, 10. Print, Canada, p. 62.

The main focus of the project management is to deliver the project in time, within the defined budget and fulfill the contract conditions. However, many large projects are still failing to meet these goals, especially in meeting cost and time objectives (Uppal, 2008: 11).

Inadequate communication, lack of business capital, excessive competition, lack of advertising and publicity, lack of sufficient experience and skill in technical matters, lack of knowledge and experience in material management and management, inventory control problem (Barutçugil, 2008: 28, Uppal, 2008: 11).

In the 1980s, project failure was due to ineffective planning, ineffective duration estimation, calculations and cost control, and changes in project objectives. In the 1990s, project failure was based on dissatisfaction, weak motivation, weak human relationships, poor productivity, lack of employee commitment, delays in resolving problems, unresolved policy issues and project managers, department

managers and other executives. Today, these quantitative and qualitative approaches are still in place for some cases. For example, the main reason for the planning error is inadequate or inappropriate risk management or the use of project management methods that have no benefits for risk management (Kerzner, 2009: 63-65).

2.6. Project Selection

Project selection is primarily to make a choice between the project alternatives and it is the question of abandoning alternative projects as a result of this choice. When there is only one project, a decision is made between alternatives to do or not to do the project.

The people who are authorized to choose the project need to understand the institution's priorities, communicate and decide on it. This basic understanding facilitates prioritization of possible projects. When prioritization is being done, answers are sought to the question of what projects will be worth to the institution, which project will best help the institution to achieve its goals, and whether both sponsors and customers will be willing to support the project (Kloppenborg, 2008: 33).

Financial and non-financial models are consulted by managers and accountants to evaluate the feasibility of alternative projects. Although financial models are used in the evaluation of almost all projects, many firms today also use non-financial models (Raiborn et al., 2003: 602).

2.6.1. Financial Models

Many managers prefer financial models to evaluate the project. These models often compare expected project benefits with expected project costs. In addition, financial models have a high level of confidence regarding the calculation of future cash flows, making them suitable for project selection decisions. Repayment Time, Net Present Value, Internal Rate of Return and Benefit / Cost Analysis Models are financial models used in project selection (Kloppenborg, 2008: 34).

Refund Period: One of the common methods used to make project decisions is the repayment period. This method measures how long the project investment can repay itself. The shorter the repayment period, the less risk the investment will be and the liquidity is expected to increase. Projects with a very long payback period are considered as over-risk projects by some managers. The most important drawback of this method is that it does not take into account future cash flows discounted by the time value of money in calculations (Weingartner, 1969: 594).

Net Present Value (NPV): The difference between the discounted sum of the cash inflows that the project will provide over its life cycle and the present value of all the cash outflows required for the

project is the Net Present Value. The project with positive NPV is taken into consideration and the project with the highest NPV is accepted. If NPV is negative, the project is rejected. This method is more realistic than other methods. Because it considers the time value of money, cash flows and profitability (Schwab and Lusztig, 1969: 507-508).

Internal Rate of Return (IRR): The internal rate of return is the discount rate equal to the net present value of zero. If the internal rate of return is higher than the profitability the investor expects from the project, the project is accepted. This ratio takes into account the time factor and the economic life of the investment in the evaluation of the projects (Feldstein and Flemming, 1964: 80-81).

Benefit / Cost Analysis: It is called benefit / cost analysis to compare the cash outflows of the project to the current value of the project with the current value of the expected future cash inflows during the economic life of the project (Bateman, 1967: 81). This ratio is obtained by dividing cash flows into initial cash outflows. If this ratio is greater than 1, it means that the projected profit can be obtained (Kloppenborg, 2008: 34).

The financial models used in project selection are summarized in Table 1.2.

Table 2. 2: Financial Models Used in Project Selection

	Refund Time	NPV	Dbl	Benefit Cost Analysis
calculation	Project Costs / Annual Cash Flows	Discounted Revenues - Discounted Expenses	Return on Project Investments	Cash Flow / Initial Project Investment
Result	Refund Time = Acceptable Time	NPV = 0	IRR = Capital cost	Ratio = 1
Projects by comparison	Shortest Repayment Time Best	High NBD Best	High IKO Best	High Ratio Best

Source: Timothy J. Kloppenborg (2008); *Contemporary Project Management*, South Western Cengage Learning, USA, p. 34.

Financial models as well as non-financial models that take non-financial criteria into account are used in project selection. These models are important for the assessment of financial viability activities that are difficult to measure. For example, in advanced technology investments and research and development investments, it is very difficult to evaluate using only financial models. Below is a description of non-financial models.

2.6.2. Non-Financial Models

While financial returns are important, they do not always reflect strategic importance. Sometimes companies can reject projects that are profitable. For this reason, non-financial criteria should be taken into consideration besides the financial criteria.

Non-financial models that do not take into account the financial criteria used in the selection of the project consist of checklists and scoring models (Gray and Larson, 2007: 34).

Checklists: It is a frequently used model in project selection. In this approach, questionnaires are used to make decisions about the acceptance or rejection of projects. The control list model provides flexibility in selecting different types of projects and is easily used in different departments and locations. Although many projects are selected using different control list approaches, this approach has serious shortcomings. The most important drawback of this approach is that it is inadequate to allow the operator's potential projects to fail to respond to their relative importance and value and to allow comparison with other possible projects. Experts suggest the use of the scoring model on the basis of these shortcomings (Gray and Larson, 2007: 34-35).

Scoring Modell: In rating models, proposals that include financial structure, technical design and other elements are scored according to selected criteria and evaluated according to these scores. The bid with the highest score is considered the best bid (Tiong and Alum, 1997: 69). These models help prioritize and select possible projects. Scoring models used in project selection are briefly described below (Kloppenborg, 2008: 35, Gray and Larson, 2007: 34);

- Identification of Possible Criteria: It shows how each potential project is compatible with the institution's strategic plans. Possible criteria include some items such as risk, duration, resources and needs.

- Determining Mandatory Criteria: Determine what criteria are mandatory for the project.

- Weighting Criteria: Heavily selected criteria are used to evaluate project proposals. The project manager determines the relative importance and weight of each decision criterion. The project with a high weighted piano is considered better.

2.7. Project Development Process

2.7.1. Life Stages

Projects vary in size and complexity. Projects, although large or small, simple or complex, often have similar lifetimes. These life spans include all the stages from the manifestation of the idea to the completion of the project.

The project life cycle is often expressed as the sum of sequential and sometimes overlapping project phases. These stages are usually completed in sequence. There are three types of relationships among project life cycle stages: sequential, overlap, and recursive (PMI, 2008: 21-22).

- According to the sequential relationship approach, one stage starts only after the completion of the previous stage. The progressive nature of this approach reduces uncertainty.

- According to the overlap-related approach, one stage starts before the completion of the previous stage. Overlapping phases raise the risk and cause some work to be redone if a later universe progresses without receiving accurate and accurate information from a previous one.

- According to the recursive relationship approach, only one phase is planned at a certain time, and the planning activity for the next phase, the current phase and the outputs are carried out in advance. This approach is useful for research areas in a largely undefined, uncertain or rapidly changing environment. However, it reduces the long-term planning ability. Project life cycle stages allow the logical sub-clusters to be separated to facilitate management, planning and control of the project. The number of phases can vary depending on the stage need and the amount of control applied and the size and complexity of the project (PMI, 2008: 18-19).

Today there is no consensus among the companies or industries in the same industry about project life cycle stages. Many projects have similar phases, some have exactly the same phase, or some have only one phase, while others have a higher number of phases (Kerzner, 2009: 68).

The project life cycle stages are divided into 4 groups. These phases are; Initial Stage, Planning Stage, Application Stage and Closing Stage (PMI, 2008: 16).

2.7.1.1. Starting Condition

The initial phase of the project life cycle is the first evaluation of the project proposal (Kerzner, 2009: 68). This phase includes the tasks of defining needs and opportunities, clearly identifying project objectives, conducting feasibility studies, defining alternatives, preparing proposals, predicting the basic budget, defining the project team, and arranging the necessary work to complete the project (Cappels, 2004: 26-28) . All of these stages in the initial phase work together as parts of a system that affects the value and cost of the project (Venkataraman and Pinto, 2008: 22-23).

The problem is the ability to have the most probable solutions to meet the most probable solutions or needs, since the initial problem, the problem or needs are clearly defined. At this stage where needs are defined and problems are clearly identified, comprehensive information is needed to determine the type and size of the problems. Various benefits can be gained if the needs of the project are clearly understood and defined. These benefits are as follows (Venkataraman and Pinto, 2008: 19-20);

- It is possible to determine all necessary project activities in order to achieve desired results,
- It monitors the project performance to ensure that it meets the actual needs identified for the project,
- The project team may not meet the needs of the contracting parties. In this case, the project can be canceled or changed,
- Allows the project team to assess the importance of each need distributed throughout the entire project period.

Defining needs and problems clearly and accurately in the initial phase will enable more realistic coverage, goals, activities and project plans in the next phase of the planning phase.

2.7.1.2. Planning Stage

The project life cycle is the planning stage, the scope of the project is defined, the objectives are clarified and the actions necessary to achieve the project objectives are defined (PMI, 2008: 39). This phase includes the tasks of conducting studies and analyzes, completing the design facilities, setting up the project team, defining the project budget and priorities, the work breakdown structure and defining the planning and control network. Moreover, this stage is very important for the financial structure of the project. In this phase, the duration, budget, resources, risks and staff of the project are mentioned (Cappels, 2004: 26-28).

In the planning phase, the project management plan and the project documents to be used to fulfill the project are prepared (PMI, 2008: 46). These documents examine scope, duration, cost, quality, risk and all aspects of procurement.

Two important perspectives of the project planning process are project scope definition and job breakdown structure. Scope definition specifies the criteria to be used in evaluating whether the basic stages of the projects have been completed. The output of this process is a report called the scope document, which defines the project objectives and requirements. Defining the scope of the project leads to the creation of the business breakdown structure, which is the most important step in project planning. In this phase, the entire project is divided into well-defined and well-defined work packages. The business breakdown structure does not ignore or reiterate any element of the business. The business breakdown structure is the basis for project estimates and cost estimates (Venkataraman and Pinto, 2008: 27).

2.7.1.3. Application Floor

The third phase of the project life cycle is the implementation phase, which means that the activities have increased greatly and that the plan has been accepted. In this phase, physical effort is intensified, activities are diversified, and complex relationships are increasing. It is the largest project in your project (Verzuh, 2008: 23-24, Barutçugil, 2008: 24).

This phase consists of the processes carried out to complete the tasks defined in the project management plan to fulfill the project contract (PMI, 2008: 39). The implementation phase accounts for approximately 70% of the total effort of the project. These phase status reports include changes, quality and forecasts (Cappels, 2004: 26-28).

The implementation phase ensures the coordination of people and resources through the realization and integration of project activities in accordance with the project management plan. The implementation phase consists of the process of directing and managing the project implementation, ensuring quality assurance, setting up the project team, developing the project team, managing the project team, disseminating the information, managing the expectations of the people concerned and managing the procurement (PMI, 2008: 55-59).

2.7.1.4. Closing phase

The stage in which the products or services obtained from the activities are delivered and the usage is presented is the closing phase where the project ends. The project is the smallest, but as important as the other phases. There are 3 important functions in this phase. These; and to monitor the

technical and managerial problems that may arise (Barutçugil, 2008: 24, Verzuh, 2008: 23–24).

The closing phase of the project life cycle covers 2-10% of the total life cycle. This phase; physical delivery of the customer product, final inspection and testing of the product by the customer, training of the customer, and care during the warranty period (Cappels, 2004: 26-28).

At the closing of the universe; (PMI, 2008: 64), the implementation of customer or sponsor acceptance, post-project or phase-out review, recording of adaptations made during the process, documentation of the courses received, application of appropriate updates to organizational process assets, and termination of relations with suppliers.

In this phase, activities such as monitoring and controlling project activities, verifying the scope, controlling the scope, controlling the timeline, controlling the costs, performing the quality control, reporting the performance, monitoring and controlling the risks and managing the purchasing are carried out (PMI, 2008: 59-64).

Since the product life cycle stages are terminated at this stage, new products or projects should be developed. The closing phase assesses planning performance and provides input into the planning stages for new projects (Kerzner, 2009: 69-71).

2.8. Project Cost Management

Businesses that want to protect and maintain their assets in an increasingly competitive environment can achieve more cost-effective results from one side with project cost management, thereby making more effective decisions and constantly monitoring changes in cost elements.

In the recent years of intense competition in which international economic relations have developed, businesses have had to change their management approach with their technology. Businesses will obtain reliable and real knowledge from cost management systems that they will need to achieve their profitability objective in the short term and to preserve their long-term competitive position. This knowledge gained from the cost management system will help managers assess and measure performance and at the same time evaluate future investment opportunities.

2.8.1. Key Features

While the share of the costs that can be directly added to the products produced after the technological developments has decreased, the share and the number of the indirect costs have increased. The two most important reasons for this are; computer-aided production and automation as a result of technological developments, reduction of costs and intensification of competition between

countries and companies in terms of quality improvement. As a result, cost allocation problems have been reconsidered and new cost concepts and methods have been developed and cost information has become a priority in decision making, planning, cost reduction and control. This will be ensured by an effective cost management system (Küçüksavaş, 2006: 746).

The cost management system is a long-running cost-improvement process designed to improve cost-optimization processes and the efficiency of covenant services, which means eliminating costs and activities that do not add value to products or services (Sobotka and Czarnigowska, 2007: 377).

The cost management system consists of methods developed to control and plan cost-generating activities in relation to long-term strategies and short-term objectives. Product costs, product profitability, application of cost management strategies and management performance are all designed to communicate with the functions in the value chain (Raiborn and Kinney, 2011: 519).

The information obtained from the cost management system benefits all of the functional areas of the business such as marketing, financial accounting, quality control, research and development, production planning and programming, investment management and production reporting (Raiborn et al., 2003: 45).

2.8.2. Purpose of Project Cost Management

The cost management system is to provide information that will help managers to efficiently use resources in the production of products or services that can compete in terms of timing, cost, quality and functionality in the primary world markets (Saban and Erdogan, 2010: 531). This information enables the optimum use of resources in the production of goods or services.

In addition, the cost management system has the following objectives (Raiborn and Kinney, 2011: 521-523).

- To control costs: It is to control the main objective costs of the cost accounting system and to realize this in a global competitive environment. The cost management system helps managers understand the processes underlying deviations.

- Measuring performance: Information obtained from the cost management system should help managers assess and measure performance. These metrics are used to assess both future investment opportunities and workforce or equipment performance.

- To improve the meaning of activities and processes: The cost management system helps executives understand the company's operations and business processes.

- Allowing the monitoring of the organizational strategy: To sustain an industry competitive position, an enterprise must acquire the necessary knowledge to define and implement its organizational strategies. The information provided from the cost management system allows managers to make strategic analyzes on strategic and operational plans, assessing financial and non-financial positive / negative factors, and identifying organizational constraints and capabilities with a cost-benefit perspective.

Effective cost management, which provides information that managers need to increase the profitability of the companies in the short term and obtain a competitive position in the long term, is calculated more accurately, losses are reduced in resource utilization and more accurate decisions are taken in global competition environment.

2.8.3. Policy

Leading principles that will help in the development of cost management are grouped under three headings: cost principles, performance measurement principles and investment management principles (Karcioğlu, 2000: 70). All of these principles must be consistent with the objectives and strategies of the entire business and its sub-units. Cost management principles are briefly explained below.

Cost Principles: One of the main objectives of cost management is to measure the cost of resources that an operator consumes while performing its activities. In this context, enterprises should be sufficient to meet all internal and external needs such as profit and financial situation. The main costing principles in the development of cost management in enterprises are set as follows (Berliner and Brimson, 1988: 13-15);

- Describe the cost of activities that do not add value to improve resource utilization,
- Taking into consideration the cost of holding the activities that do not add directly to the product,
 - to set up a separate cost center for each homogeneous group activity in accordance with the responsibilities of the organization,
 - To improve the traceability of costs through activity based costing, to set up different distribution keys to realize cost allocation,
 - To calculate the costs of the activities supported by the entire product lifecycle costing approach including product development, production and logistics,

- Develop effective cost management approaches for internal control.

Performance Measurement Principles: The aims of performance measurement are to measure the realization levels of the goals and objectives developed in the planning process and to help to eliminate the losses (Karcioğlu, 2000: 71). The principles set out to achieve the desired performance measurement goals are as follows (Berliner and Brimson, 1988: 16);

Performance measures should be determined for key activities,

- Performance measures should be established to determine the traceability of cost drivers,
- Performance measurement should include both financial and non-financial metrics that are both easy to understand and measurable,
- Performance measures should be compatible with business strategy related activities and business objectives.

Investment Management Principles: The aim of investment management is to determine the most suitable source and activity structure that will reach the objectives and targets with minimum loss (Karcioğlu, 2000: 71). The basic principles of investment management are listed below (Berliner and Brimson, 1988: 17);

- Investment management is more comprehensive than capital budgeting and involves, defines, and implements new activities or alternatives,
- Investment management decisions must be consistent with company objectives and strategies,
- The investment strategy shall include the risks and benefits of the activities to which it relates,
- Activity information should follow certain investment opportunities,
- Performance should be improved by focusing on investment decisions and these decisions should support reaching the target financials.

Raiborn et al. (2003), cost management consists of three main elements: reporting, informing and motivation. These principles are briefly explained in Figure 1.3 above.

The reporting principle uses top management information on the performance of the operating system's subsystems. The informing principle provides the managers with the information necessary to take management decisions and to measure the performance of the sub-systems and the managers. The

motivation principle encourages executives to make the best actions for the entire operator and its subsystems (Raiborn et al., 2003: 63).

2.8.4. Efficiency in Project Cost Management

Project cost management is the process of reducing the cost of a project by maintaining both the extent and quality level of outputs within the acceptable period of the project (Rad, 2002: 81).

With project cost management, it is aimed to decrease the costs, increase the quality, to realize the work time plan effectively, and to realize the product within the targeted budget limits (PMI, 2008: 165). It is also another goal of project cost management to monitor the progress of the project, to compare the realized values with the planned values, to analyze the effect of the project and to take the decision in view of this deviation (Rad, 2002: 81).

Project cost management uses all appropriate tools and methods in an effort to further improve efficiency. The essential factors for effective management of project costs are explained in detail below (Cullen, 2004: 12);

- Use standard formats; The standard format is required for project-to-project and project-to-project information communication.
- Focus on cost drivers; In projects, it is important to focus on cost drivers to deliver the costs correctly.
- Emphasize planning, programming and early design; Cost management should be based on planning, scheduling and early design in the decision-making process.
- Pay attention to the relationship between quality and cost; The relationship between high quality / high cost items is a sensitive and special consideration.
- To evaluate life-cycle costs; Future cost applications should be evaluated together with the initial capital cost.
- Planning and managing unforeseen circumstances and risks; More attention should be paid to unexpected events and high cost and risk variables.
- Being aware of the competition and the market; Competition and market factors on project cost have the most important effect and need to be evaluated carefully.
- Use past information correctly.

In addition, in order to effectively manage costs in the project, the following basic factors need to be fulfilled as well as the following processes (Pilcher, 1994: 201);

- To provide periodic explanations on profit and loss for each project at regular time intervals (usually monthly for large projects and weekly for small or fast-moving projects)
- Provide the necessary knowledge to guide the company from business areas that are very profitable and are well equipped to perform the job,
- Providing information about the equipment and facility without evaluating the location of the place of purchase and the most economical tool selection for the work to be done,
- To prepare relevant budgets for future operations of the company, which will contribute to the preparation of the company's overall production and general administrative expenses,
- When preparing the cost estimate, to check the effectiveness of the initial estimates and to establish a separate staff cadre for the purpose of collecting feedback information,
- Determine activities and operations that are continuing in an unscheduled manner within the project, such as excessive waste of material, ineffective use of labor or equipment, uneven distribution of resources.

In the project cost management process, it is easy to reach the goal of reducing the costs of the project by maintaining both the scope and the quality level of the outputs within the acceptable period of the project, by providing the essential factors necessary for efficient management of project costs and fulfilling the operations.

2.8.5. Optimization in Project Cost Management

Especially the projects of the enterprises working in the service sector are very uncertain in their structure. The average level of these uncertainties; regardless of the size of the projects, the contract type used and the application methods (Howell et al 1993). These uncertainties, which are project-specific, make it impossible to predict project outputs in advance (Oberlender 2003). But; the structure that emerges after the project is completed should be in line with the planned structure so that a project can be considered successful (Oakland and Marosszeky 2006). In this sense; the planning process in which the projected duration, cost and quality are precisely determined, together with how the customer needs will be met, is one of the most important elements of project management and at the same time a guide for the project of the project.

With the development of technology, different application methods that serve the same purpose in today's localization sector are used. In the planning process different alternatives are created, evaluated and selected according to these methods, materials and equipments (Ballard and Zabelle 2000, Bennett 2003). Therefore; The planning process is actually a decision-making process. At the heart of all decision-making processes is the concept of optimization, which is defined as the choice of the best alternative for a purpose (Chong and Zak 2001). All alternatives should be elaborated as much as possible so that an effective optimization can be achieved. Because; Although the decisions taken in the planning process have a great effect on the duration, cost and quality of the project, these decisions are taken with insufficient data. (Allen et al. 1995).

The best alternative is to be selected and elaborated as quickly as possible (Bernstein 1998, Ballard and Zabelle 2000, Raudberget 2010) in order to save time by not dealing with other alternatives in the planning process of all projects, regardless of the sector they are practicing. In this approach, which is defined as Point-Based Design (PBD), the decision-making process usually results in local optimization because decisions are made for only one alternative. But; production activities carried out in business projects are in interaction. In other words; the completion of an activity affects not only the project but also the duration, cost and quality of other activities connected to that activity. In this sense; a global optimization should be carried out in which the projects are assessed by elaborating all alternatives locally for effective optimization in the planning process. Although Ballard and Zabelle (2000) considered time-saving savings in the NET approach, they recommended implementing the Cluster-Based Design (CBD) approach in their projects to reduce this risk, stating that this approach re-runs the activities and therefore increases wastage.

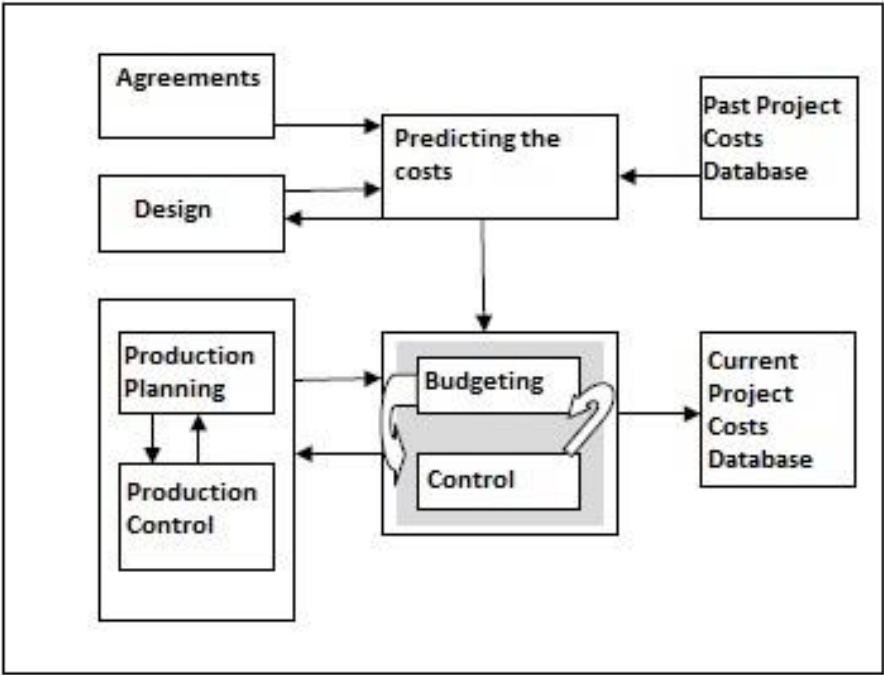
A metrourge developed by CBD Toyota that evaluates multiple alternatives simultaneously in the planning process (Bernstein 1998, Ballard and Zabelle 2000, Parrish et al 2007, Raudberget 2010). In this approach, the ratios between multiple alternatives are systematically examined and those that are not available are eliminated (Raudberget 2010). Therefore; all appropriate alternatives for the planning process are carried to the latest possible time (See et al., 2012), allowing them to be elaborated (Parrish et al 2007). Sobek et al. (1999) have identified three basic principles for design space design for KET, including intersection and alternatives in the solution set and ensuring feasibility of alternatives. In this sense; firstly, all the alternatives that meet the criteria of the objective for each objective determined in the projects are put together and a cluster is created and thus the design space is determined. The purpose of the creation of these clusters is to emphasize what can be done to achieve the greatest possible solution (Bernstein 1998). In the next stage, these clusters are intersected and alternatives that provide all the objectives are determined. Finally; the applicability of each alternative is selected as appropriate.

Depending on the use of resources in construction projects, numerous application alternatives can be developed for any production activity and the duration, cost and quality of the alternative networks for the project, which are derived from the FDI, vary depending on each alternative applied to the project. The three main objectives of project management are; to complete a project as soon as possible, at the lowest cost within the budget and to meet customer needs at a minimum level. But; Although these three aims are related to each other, they are contradictory at the same time. In other words; the positive change to be made in any of these three elements can affect the other two elements positively. Therefore; the limit values that can be accepted for each purpose should be determined so that the project can be optimized by providing a compromise between these three elements.

2.9. Project Cost Management Process

Project cost management consists of estimating, budgeting and controlling costs so that the project can be completed within the approved budget, and the scheme for this process is shown below.

Figure 1: Project Cost Management Scheme (Source: PMI, 2008: 165)



These three processes in project cost management come after the planning work of the project management team. Planning studies are part of the project management plan development process in which the criteria for estimating, budgeting and controlling project costs are determined and the cost plan is set. Cost management processes and the tools and techniques associated with them are often included in the cost management plan (PMI, 2008: 165).

Figure 1 shows that the cost estimating process derives the necessary information from the

existing cost database, contracts, design and production plans. On the other hand, information obtained from cost management systems is used to support the control of design and production planning and processes and to update the cost database. Similarly, production planning and control, cost budgeting and control is a cyclical process. Knowledge of the production control and cost estimating processes is used to provide cost data feedback that can be used in future projects. Cost management systems, as well as contracts, designs and production planning and control are dynamic, and they must take on prospective features and be flexible to adapt to the changes that may occur (Kem and Formoso, 2004: 5).

The project cost management process, which consists of estimating, budgeting and controlling project costs, will be examined in detail on a sample business in the implementation section of the work.

2.10. Project Budgeting

Budgeting is the process of allocating costs to individual pieces of work to determine the cost basis to measure project performance. Budgeting includes understanding when and why, what costs will come to fruition, and it clearly follows this from project decision and calculation activities. Cost estimation and budgeting are important issues to be considered in all projects. Accurate cost estimation and budgeting are important for project proposal.

2.10.1. Project budget

A budget is the amount and value of an operator's expected and desired development in a future period. A chart that shows how budget managers can get and use resources at specific time intervals. The Budgeter has the goals of estimating developments for the next period and identifying concrete objectives, facilitating planning, communication and coordination, disseminating resources, managing financial and operational performance, and evaluating performance (Hilton, 2006: 597, Küçüksavaş, 2006: 416).

Benefits provided to businesses by the preparation of budgets, which are estimates of future events; determining the basic policies, objectives and the means of production necessary to achieve the aim of the operator, by determining the objectives of the operator; place a rational decision-making tradition in business management; coordinating the actions of various department managers; compulsory management of the business, planning to use the production factors in the most efficient way, and making periodic analysis and evaluation of the actions, revealing the differences between the budgeted and actual results (Saban and Erdoğan, 2010: 482);

Project budgeting is the process of consolidating the calculated costs of work packages or individual activities that outline the approved cost estimate. Project cost performance is measured by comparing to the approved budget (PMI, 2008: 174).

The project budget, which is a consequence of the planning process, should be reasonable, accessible and based on the contractual disclosure of the work and the resulting costs of the negotiations. The budgeting planner needs to understand the standards very well. Standards are divided into performance results as standards and process standards. Performance results standards are quantitative measures and include elements such as job quality, job size, job cost and completion time. Process standards are qualitative and include personnel, functional and physical relationships (Kerzner, 2009: 631).

The project budget should identify planned labor requirements, contracted funds and management reserves. All budgets must be traceable, and management backups should include changes to the distributed budget (normal performance budget), the unallocated budget, and the contract. Management backups are often the amount of money that is set for unexpected problems and the likelihood of outsourcing. The management backup is controlled by the company's project manager and is used in the event of an increase in general management expenses, raw material prices and salaries. Management backups should not be used to hide budget overruns or poorly planned forecasts. The distributed or normal performance budget consists of work packages to be performed in order to fulfill the tasks that the project loads and cost estimates of these work packages. Changes to the contract are related to changes in the performance budget. Unallocated budget indicates the logical grouping of jobs in the contract not yet defined and allowed (Kerzner, 2009: 644-645).

The project budgets prepared in the undertakings must fulfill the following tasks (Pilcher, 1994: 210-211);

- If the operator, department, project or other subdivision of work to organize their goals,
- Alternative plans to achieve different goals , best of resources to make comparisons between the plans made for use and the best choice and the resulting analysis,
- To provide efficient use of limited resources , such as working capital to facilitate the organization of a number of activities carried out in all or part of the business,
- The actual performance is to provide guidance to the level of success that is appropriate for the company when compared to the targeted performance,

- It measures both the performance and the cost of plans to be developed against the effectiveness of actions to correct negative trends or to take advantage of trends that are useful.

In addition to these tasks, the project budget should take into account all necessary resources, be timely disclosed on a specific basis, and be expressed explicitly in cost estimates (Tonchia, 2008: 126).

2.10.2. Project Budgeting Techniques

Tools and techniques used in project budgeting; (PMI, 2008: 177, Heldman, 2007: 303). In addition, the cost of capital is the sum of costs, resource analysis, expert opinion, historical relations and capital consensus. These tools and techniques are briefly explained below.

- **Collecting Costs:** Cost estimates are collected through business packages in accordance with the business breakdown structure. Work package cost estimates are aggregated for the entire project and parts of the work breakdown structure (Heldman, 2007: 303).

- **Source Analysis:** Both budget source analysis, management resources for the project and unexpected sources are both identified. Unexpected sources of resources are allowances for any necessary changes that may arise from the occurrence of unplanned but defined risks. Management resources are budgetary sources for unscheduled changes in project scope and cost. Sources are not part of the project cost baseline, but there is a total budget for the project (PMI, 2008: 177).

- **Expert Opinion:** The expert opinion is based on expertise in the field of industry, knowledge and practice that is appropriate for the activities used when determining the budget. Some opinions are provided by specialized training, knowledge, skills or by any person or group. The expert opinion can be obtained from many sources. These; sectoral groups, professional and technical groups, stakeholders including customers, consultants, and other units of the project executing the project (PMI, 2008: 177).

Historical Relations: Any historical relationship that is the end result of analog calculation and parametric calculation includes project properties used to develop mathematical models to estimate total project costs. Both parametric and analog models can change both cost and accuracy. If the historical information used for model development is correct, the cost and accuracy relationship is very reliable if the variables used in the model can be easily measured and if the models can be scaled for large projects, small projects and project phases (PMI, 2008: 177-178).

Settlement at the Capital Limit: Compromise at the capital limit involves reconciling the amount of funded funds with the amount of budgeted funds for the project. The organization or

customer determines the capital limit (Heldman, 2007: 303). Capital expenditures should not exceed the committed capital limit for the project. The change between planned expenditure and cap capital may require re-planning of work by regulating expenditure rates (PMI, 2008: 178).

After the project costs are estimated and the project budgets are created, the final stage of the project cost management is checked.

2.10.3 Control of Project Costs

Project cost control is the process of measuring progress, monitoring costs, and recording and analyzing information by comparing the progress and performance of the project with the project plan to ensure that the project is completed on time, within budget and with customer satisfaction (Kerzner, 2009: 630). In cost controls, costs realized with budgeted costs are compared and monitored. Budget estimates show budget deviations compared to actual costs (Younker, 1990: 13).

Deviations from the project cost plans for the effective cost control system in the projects should be defined and corrective measures should be allowed. In this context, the control system should be able to monitor current costs, compromise these costs with the plan and establish improvement procedures to keep them at acceptable levels, and help identify where improvements are needed and what indicators are needed (Bozkurt and Müngen, 2010a: 482). In short, an effective cost control system should monitor both time and performance and costs by organizing the budget, comparing and measuring expenditures against the budget, identifying differences, convincing expenditures that they are in place, and taking corrective action when necessary (Kerzner, 2009: 634).

Project cost control supports the effort to reduce the cost of the project and attracts the attention of the project to areas that may be caused by an increase in projections or misconduct. The project has two goals in cost control; the project is completed in the foreseen period and completed at the predicted cost. These two goals are followed by cost / time performance reports that have been achieved. It is understood from the time deviations and cost deviations figures (Küçüksavaş, 2006: 282) in these reports that the projected business volume has been realized at the end of the month and that the expenditure is below the required amount for this business volume. Other objectives of cost control are listed below.

- If a certain process or process in the project is made inefficiently, ensure that the necessary warning is given to the project management immediately (Bozkurt and Müngen, 2010a: 482)
- Ensure immediate warning of non-economic transactions in the short and long term (Pilcher, 1994: 208),

- Provide feedback to the team that will be involved in preparing the initial bid for the project and many future proposals, with careful consideration of all the details of the applied business (Pilcher, 1994: 208)
- To provide the necessary data for the evaluation of the changes occurring during the construction of the work (Pilcher, 1994: 208)
- Providing information for cost analysis and assessing possible risks and their impacts, reducing risk, and providing accurate and timely information to the project team (Wulke and Kohl, 2004: 11th).

The realization of project cost control objectives is among the responsibilities of all members of the project team. Project cost control needs to have some basic principles in order to realize these objectives.

These principles are listed below (Wang, 2011: 2);

- *Detailing principle:* Cost control should focus on the details.
- *The principle of each view coverage:* Project cost control should cover total staff and all process.
- *Target management policy:* Cost control often follows the principles of "setting objectives, explaining responsibilities and practices, checking implementation results and evaluating and changing targets" so that project management is shaped.
- *Unexpected state control policy:* The project manager should evaluate and take the earliest stages of the project related to unexpected situations and risks.
- *The Association of Responsibilities, Rights and Interests:* Project managers must undertake cost control responsibilities of various departments and teams and regularly evaluate and control the performance of the cost control process.

It is important to have detailed and clearly defined work packages for complex projects. Thus, communication errors can be minimized. From the headquarters, monthly reports of engineering and design, man-hours and expenditures, drawing process and completion features are taken. From the large book, detailed coded expenditures and obligations are taken. From the records of the time recorder, technical staff man-hours expenditures are obtained. The amount of materials and equipment on the scene is obtained daily from the foreman or construction supervisor. All ordering orders are either in the headquarters or in the area (Bauman, 1959: 68).

2.10.4. Control Process

The project cost control process usually begins with the identification of the customer's goals and ends when these goals are realized. The client's request is to obtain the project within the agreed time frame, designed to meet the budgetary needs (Jaya et al., 2010: 243).

Before project cost control, pre-check plan based on detailed project drawings is carried out in order to realize cost control first. The cost calculated before the control is the bid price. Project bid price should be determined and calculated according to the whole production cost. In the process of applying the project: actual resources and costs are defined. In the project cost control process, there are deviations through the comparison of planned cost and actual cost (Wang, 2011: 2-3).

Cost control begins when the budget is set. The budget should not be prepared from the period under consideration of the underlying reasons for the change in cost, and the cost control should not be carried out without knowing the budgeted amount or why the costs are different between periods (Raiborn and Kinney, 2011: 698).

Below are the steps to be followed when performing cost control (Ellis, 2006: 68);

Creating the Basis of Project Cost Control

The basis of project cost control is the project cost estimates. In the initial phase, only a preliminary estimate or size estimate is made for cost estimation. With the end of engineering designs, more accurate estimates of cost are being developed. Detailed cost calculations based on the amount of work determined from the completed project drawings and specifications provide a more accurate estimate of cost. This detailed cost estimate forms the basis of project cost control (Ellis, 2006: 60).

It is also important to prepare the project master plan for the establishment of the project cost control basis. By establishing the plan, the necessary features are provided to measure project performance. The creation of the plan begins with the creation of an error-free business breakdown structure that sets out all of the project-related tasks and work packages, empowers staff responsibilities, and creates a hierarchical representation of the project from the top to the bottom. In forming the project master plan, the project team is designing different tasks, budgets, resources and time phases of all work on the project network diagram (Venkataraman and Pinto, 2008: 106).

Properly prepared cost control budget and project plan are the basis for a successful project cost control system. The cost control budget is used as a benchmark to track the progress of the entire project and the actual cost. The cost control budget and project plan are two important components for

all of the project management activities.

Total Actual Cost Information

It is the process of collecting the project cost information needed by the project managers by creating a control system that measures the situations of the project activities required. This information is collected, categorized and recorded last (Venkataraman and Pinto, 2008: 106).

Actual cost information should be organized in accordance with the project cost control budget, regardless of how this information is gathered. The comparison of budgeted cost with actual cost can only be made when the costs of both classes are classified, summarized and presented in the same form (Ellis, 2006: 63) .

Reporting and Evaluating Cost Control Information

Cost control reports provide a comparison of the actual cost with the target value to the substance. Deviations from the cost budget are presented as a percentage or as a real value (Ellis, 2006: 64) .

Analysis of deviations is important to determine the current project status. When the deviation between the basic plan and the actual performance is smaller, it will be easier to take corrective measures that will be explained in detail at the next stage (Venkataraman and Pinto, 2008: 107).

Getting Corrective Measures

One of the primary functions of the cost control system is to identify the problem areas early on by the managers. Corrective measures can therefore be taken. The problem in the project has a wide variety of sources. These; calculation error, change in material prices, change in labor costs, or change in work efficiency. The cost control system can not identify the cause of the problem, but tells where to look for the cause of the problem. In addition, the cost control system provides governance feedback and is influenced by any corrective action (Ellis, 2006: 67).

The project manager may prefer to reduce costs or avoid cost as corrective measures. Variable and total fixed costs per unit of return from the period should be minimized during the process of reducing costs. Reducing costs is not possible for inflation correction, tax and regulatory changes, supply-demand correction. Because these pressures come from outside the operator. Cost reduction can be very effective if it can be applied. Sometimes cost reduction may not be possible, cost avoidance strategies can be applied instead. Avoiding cost includes finding high-cost piece alternatives or not spending money on unnecessary services and goods. (Raiborn and Kinney, 2011: 700-701).

Tools and techniques such as earned value analysis, variance analysis and estimates are used to realize project cost control. In the following, these tools and techniques are discussed in detail (PMI, 2008: 181).

Earned Value Analysis

Earned value analysis is defined as the value of work done according to the budget. It shows the total value of the project and the rate of progress of the given time (Tonchia, 2008: 131).

Earned value analysis shows the winning value of the completed job and predicts the future trend of project performance by comparing projected performance, projected value and actual value. In addition, earned value analysis combines project scope, cost and time measures without helping the project management team measure and evaluate the project performance and progress (PMI, 2008: 181; Khamidi et al., 2011: 125).

Earned value analysis tracks and improves on three key measures for project cost control action. This measure;

- **Planned Value:** An approved budget is assigned to the work to be performed for each piece of activity or business breakdown structure. The planned value is the total budget drawn on the time axis, which is shown assuming expenditures are made in accordance with the project plan. The total planned value for the project is also called the planned budget (Newell, 2002: 87).
- **Worth:** The value of an activity or work breakdown structure is the value expressed in terms of the approved budget allocated for that work. Acquired value is usually used to define the percentage of completion of the project. The project manager follows the long-term performance trend and the value gained in determining the current situation (PMI, 2008: 182).
- **Actual Cost:** The total cost incurred and recorded for the completion of the work performed for an activity or business breakdown component. The gauge of earned value is the total cost of completion of the work (PMI, 2008: 182).

The value added approach emphasizes the importance of early prevention by early identification and resolution of problems in the project. This system allows early warning systems to identify differences and trends on the board early. It also provides ample time for the project manager to make minor changes in the process, with an early warning system (Kerzner, 2009: 647).

Variance Analysis

Cost control involves investigating the causes of positive and negative variances. Variance refers to deviations of a particular plan from various angles and these deviations are determined in terms of time, quality, quantity and cost (Bozkurt and Müngen, 2010a: 482).

There are differences between planned and actual expenditures in project measures and control. The use of variance to measure project performance is the oldest and most common technique. It is possible to draw a detailed picture of the project when the planned and actual value is taken into consideration. Two basic variances can be calculated by the various expenditure curves plotted for the budgeted cost of the planned work, the budget cost for the actual work and the actual cost for the actual work. These are "budget revision variance" and "total cost variance variance". These are the main project variances that show the change in project costs compared to the budgeted expenditure of the project (Al Jibouri, 2003: 147). If the project variance is negative, the variance indicates an increase in cost. In this case, payments should be stopped until detailed evaluation of the project costs. If the project variance is positive, it indicates that the variance costs are less than planned. This situation is perceived as a positive situation desired by the project manager.

Predictions

If the planned budget is not feasible, the project manager is developing an estimated cost of completion as the project progresses. Estimated cost of completion includes estimating or calculating the future performance of the project, the future performance of the project, and any future events and conditions based on any available information that may affect the project in the future. Estimated completion costs are obtained by the project manager and project team, usually by estimating the actual costs incurred from completed work and the costs required to complete the remaining work (PMI, 2008: 184).

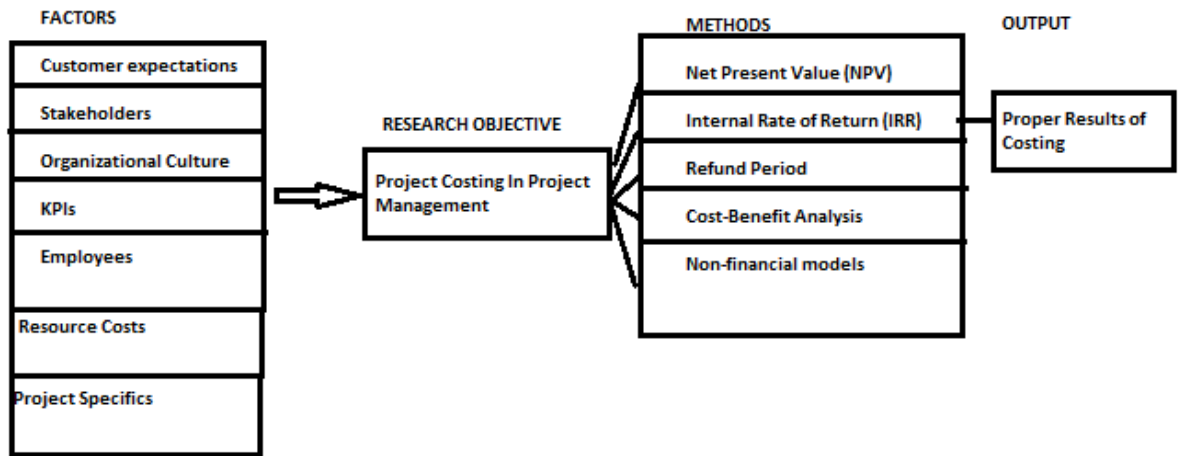
2.10.5. Control Results

Business managers demand that the planned costs and the targeted costs are in harmony with the planned costs and that the incompatible costs are determined by the cost controls and that their causes are investigated and timely intervened. For this purpose, many studies have been carried out on the causes of cost deviations that occur as a result of cost control both domestically and abroad. The work carried out domestically and abroad as a matter of thesis work is limited to the construction sector.

In the literature, the design change in the project has been identified as the most important cause of this discovery in the studies investigating the reasons for the deviation from the planned cost in the construction projects in general (Simon, 2002; Le-Hoai et al., 2008; Olawale and Sun, 2010, Muratoğlu, 2010). Simon (2002) defined the problem of information access, calculation methods,

design team performance, time constraints, and project management as well as the design change in the project with the questionnaire survey applied to expert accountants working in this sector in order to investigate the reason why the budget was exceeded in the construction projects in England . Le-Hoai et al. (2008), as well as the reasons that Simon (2002) found in the study of construction workers, contractors and project advisors in Vietnam in the construction sector, as well as financial difficulties, unexpected land conditions and material deficiencies are frequent causes of cost deviations in construction projects have. Olawale and Sun (2010) also conducted a survey on cost increases in construction projects in the UK, such as Simon (2002), and identified design change as the most fundamental cause of cost variance. However, the risks and uncertainties associated with the project differ from the work of Simon for other reasons such as improper project time evaluation, subcontractors and failed supplier's tasks, complexity of work, inconsistency between project groups. Finally Muratoğlu (2010) around Istanbul, Turkey, medium and large-scale building construction site in the site with surveys that apply most common costs of bias as well as the design changes in unit costs rise, weather conditions, has determined initially did not complete that additional work.

Nassar et al. (2005) and Kaliba et al. (2009) examined the specific areas of the construction projects such as the pavement construction project, the road construction project, and not the whole of the construction projects like the above works. Nassar et al. (2005) assessed cost increases in pavement construction projects in the United States, and came to the conclusion that timing errors, costing errors, calculation errors, quantity errors, unplanned additional jobs, productivity problems and poor planning were the drivers of cost increases . Kaliba et al. (2009), in contrast to Nassar et al., Have identified the reasons for cost increases in road construction projects. Detailed literature searches, interviews with experts and survey results have been identified as the main reasons for the cost increase in bad or hard weather, change of activity area, environmental protection costs, delays in the plan, strikes, inflation and government roadway construction projects.



As can be seen from the above diagram, there are many factors influencing the project costing in project management such as customer expectations, stakeholders, organizational culture, KPIs, resource costs and employees. However, it is not possible to make project costing assumptions based on these factors because they change depending on the projects. Moreover, these factors cannot be used as the basis of a project costing method because there are many variables in their performance, effectiveness and reliability. In order to understand the nature of these factors and how they can be managed in the most effective way in a project costing method, these factors should be analyzed in depth.

In an attempt to calculate the project costs effectively in service sector, methods such as net present value or cost benefit analysis could be used according to the previous research. However, these methods are costly and time consuming which is not practical to use for projects that have small scope and a less demanding client. Moreover, project specifics change even for the same client. For certain project lines the client may have higher quality expectations while for the other project line an average quality service could be sufficient. Thus, it is not possible for service sector companies to choose one single project costing method which they could use for all projects that they undertake. Methods that will be chosen for the service sector projects should be based on the input factors such as project specifics, resources, project team and customer expectations.

3. RESEARCH METHODOLOGY

Businesses that want to protect and maintain their assets in an increasingly competitive environment can achieve more cost-effective results from one side with project cost management, thereby making more effective decisions and constantly monitoring changes in cost elements.

In the recent years of intense competition in which international economic relations have developed, businesses have had to change their management approach with their technology. Businesses will obtain reliable and real knowledge from cost management systems that they will need to achieve their profitability objective in the short term and to preserve their long-term competitive position. This knowledge gained from the cost management system will help managers assess and measure performance and at the same time evaluate future investment opportunities.

While the share of the costs that can be directly added to the products produced after the technological developments has decreased, the share and the number of the indirect costs have increased. The two most important reasons for this are; computer-aided production and automation as a result of technological developments, reduction of costs and intensification of competition between countries and companies in terms of quality improvement. As a result, cost allocation problems have been reconsidered and new cost concepts and methods have been developed and cost information has become a priority in decision making, planning, cost reduction and control. This will be ensured by an effective cost management system (Küçüksavaş, 2006: 746).

Exogenous factors such as instability and uncertainty in the current economic situation and increasingly competitive environment force businesses to achieve cost, time and quality objectives at the same level and at the highest level. Localization enterprises are trying to maintain their existence in this competitive environment by decreasing service costs without decreasing quality.

Losses caused by inefficient cost management, stemming from the lack of modern management information technology and the still use of traditional cost management methods, result in businesses losing their competitive advantage both in the world and in our country. For this reason, effective project cost management is very important for the localization sector.

In this study, many companies in the world will try to show the strategic cost management process. The aim of the research is to give an idea about how to manage costs more effectively. In addition, this thesis aims to establish a cost model that can be used in the decision-making process in the localization sector, obtain reliable cost information, and constitute an example for the cost management applications in the literature that are clearly lacking in the localization sector projects.

Research Method

Nowadays, businesses are trying to design products from the price that they are ready to pay according to the features they want and to reach the profitable targets in order to get competitive advantage, to produce their products with the most suitable cost and to reach the price determined in the product design phase. Therefore, modern costing approaches should be used to cover different accounting methods in product design, production and control phases. For this purpose, the content of the project cost management has been examined and the implementation of these methods has been included in a large enterprise operating in the localization sector.

In this sense, the literature on the project management and project cost management was first included in the study. Afterwards, a face-to-face interview was conducted with 9 people in managerial position in the operation of UAB Synergium and the project managers were asked about project cost management and the related data were interpreted by qualitative data analysis method.

The research is limited to the executive managers and project coordinators of the company, and it is assumed that the statements of the managers participating in the investigation are correct. It was aimed to draw a table on the project cost management of the relevant manager with statements of the managers participating in the research and conclude the research by blending the research with the literature section.

For this research narrative method for describing the content of the analysis was chosen. Within the scope of the research, a face-to-face structured interview was conducted with 9 employees who are in executive positions at UAB Synergium and their responses have been observed according to the following questions:

1. Which departments are involved in the project costing within the scope of project management? Please elaborate how your department is involved in project costing.
2. When the past periods are taken into consideration, do the cost and profit that is foreseen by project costing, coincide with reality? If so, to which degree?
3. What is the impact of project costing on the efficiency and profitability of the project?
4. How is project costing carried out and how does the process work? What are the weakness or effective parts in this process? What would you change in process?
5. Is it possible to reduce costs without sacrificing efficiency in the related sector when looking at the sector specific? In what ways can it occur?
6. How does the customers effect project costing and what is their role in this process?
7. What other stakeholders affect the project costing process? How does the stakeholders

effect the decision-making process for project costing?

8. When you look at the industry, which factor do you think has the most importance on project cost management? How much control do you have over this factor?

4. RESEARCH FINDINGS AND DISCUSSION

The participants were firstly asked about by which department the project costing is carried out and what is the role of their department in project costing. The majority of the participants emphasized that the project management department plays the most important role in project costing.

Aurimas, who works in the project management department as a project coordinator from the participants, used the following statements:

The project management department negotiates the budget with the customer (what kind of charge will be applied to the charge per unit, such as the hourly fee to be paid, the number of effective words, etc.). The project management department is primarily responsible for the cost of the project not exceeding the budget. Project managers also interact with project cost by communicating with interpreters and editors. For example, asking for discounts on some projects, offering high fees normally for difficult projects requiring expertise, etc. At the same time, the project management department should pay attention not to exceed the cost of the services requested by the client other than the translation and arrangement.

Aurimas pointed out that the project management department has been paying attention to project costing and that the project management department has also effectively calculated the costs in communication with the interpreters and editors.

Maxym, who also works in the project management department as a project coordinator, used the following statement when asked which departments are involved in project costing:

In our conditions these departments are linguistic department, QA department, sales department and project management department itself. Within our department which is project management we allocate human resources (linguists and QA engineers) for a specific project and this, in turn, affects the project budget.

Maxym points out that apart from project management department, which is responsible for allocating the human resources for a project such as linguists and QA (Quality Assurance) engineers, linguist department, QA department and sales department also pay a role in project costing process.

In a similar way, Gintautas, who is the team leader in the project management department from the participants, pointed out the project management department's influence on project costing and gave the following statements:

In general, the project management department is involved in project costing and plays the biggest role. If the customer is new, then the sales department will take over because pricing and conditions need to be set. The project management department determines the project scope and budget, and the project managers follow the profitability ratio carefully during the project. We use Plunet and various reporting software to track costs and profitability.

Participant Gintautas indicated that Plunet and various computer softwares are used in the project management department to track costs and profitability. Gintautas also indicated the role of sales department in project costing and pointed out that if the customer that they are working with is new, sales department need to set the pricing and the conditions so that the upcoming projects would have a base for project costing.

The sales and marketing department is mentioned as another important department in project costing in the company. The sales and marketing department sets out customer expectations and gives an idea to the project management department about costing. Jonas, who works as a senior project coordinator from the participants, summarized the project costing process as follows:

- 1- Marketing and Sales Department: Determination of pricing policies with customers
- 2- Project Management Department: Selection of appropriate resources for the project and calculating the number of effective words for each particular project.
- 3- Quality Control Department: The more time that a quality control engineer has to spend on the project, the higher the cost becomes.

From the participants, Jonas emphasized that the marketing and sales department had assumed the role of the general pricing policy according to the needs of the customers and then the project management department was responsible for selecting the relevant and suitable resources and making a cost prediction according to the project. The quality assurance department, at the end of the project, makes the benefit cost calculation. On the other hand, the time spent on the job also has to keep the foreseen time.

Irina, another participant, noted the importance of the human resources department in project costing. The human resources department deals primarily with translators and editors during the project phase. Irina expressed the project costing phase as follows:

Departments involved in the process:

- Human Resources: Finding and agreeing with interpreters and editors. Ensuring the necessary agreements and prices

- Sales and Marketing: Finding new customers, setting pricing policies, specifying extra conditions and agreements

- Project Management: Assigning proper resources (translator, editor, QA Engineer) for the projects, calculating the effective wordcount, estimating the budget for each particular project

I am the manager for the sales and production department. Carrying out new agreements with existing / new customers, carrying out relations with customers and setting pricing policies are some of my responsibility areas. At the same time, I undertake the duty of giving price quotations for potential projects. In addition, sales specialists are responsible for general pricing for the language combinations we sell.

When the participants were asked about how well do the cost and profit that is foreseen by project costing, coincide with reality, most of them commented on this question said that the project costs and the extent to which the profit coincides with the reality often overlap.

Participant Gintautas gave the following statements for the last two periods:

In 2017, project cost and projected cost and profitability were 95% compatible. In 2018 we developed a new process: to pay according to the time spent on the project instead of paying for the number of words. With this method, we were able to significantly reduce costs. But since this method is fairly new, we can now determine profitability with 60% accuracy when we make project costing using this method. By the end of 2018, we plan to do the right project costing by 90%.

Gintautas' information on this issue seems to be more detailed than the other participants. The other participants often said they usually overlap. One participant reported that there was no information on this subject.

Participant Asta, who is the project management department manager in the company, stated that the foreseen costs and the actual cost of a project differ only when an unexpected situation

happens in the project by the following statement:

They do more often than not. Projects in our case are usually not big, at least if we compare our projects to the projects in constructions industry, IT software industry, etc. Since we know what amount of words we have to translate, we can more or less forecast the expected cost and the profit, given the linguists costs for the same amount. It differs only in case something unexpected happens - e.g., a delay, more complex than anticipated content for translation, technical issues caused by our side so that we have to absorb them and not the client or the linguist, etc.

Participants' responses differ when they are asked about the impact of the project costing phase on the productivity and profitability of the project. The two participants clearly stated that the project costing phase had little impact on productivity and profitability. Asta, one of the participants, has included the following statements in this regard:

I would say minimal, since we have the agreed rates with the client. Translation projects are different to other industries (or maybe other translation agencies), because we have agreed rates with clients for different languages. Then we either have to calculate the wordcount or the client says the payable wordcount themselves. Since calculating wordcount is a part of project management anyways (as linguist should know the amount of work they are accepting, they need to plan, and we need to plan as well), it has quite minimal effect on the overall project profitability. This is speaking of usual, regular projects; if we take some very big not standard projects, with complex file format, it might indeed take a long time to understand how much we will have to charge the client. In these cases, though, we sometimes still try to share the costs with the client - e.g., if client asks for a quote and he does not order afterwards, we might ask the client to cover the hours spent for costing the project.

Among participants, there are those who think that the project costing process has a significant influence on profitability. Participants Jonas said project costing has an impact on profitability, but not on efficiency. Jonas emphasized that the projects preparation and the budgeting process is always the same regardless of the project being profitable or not.

On the other hand, it was emphasized that extraordinary situations could not be detected at the cost of the project. The cost estimation taken prior to the project does not match the actual situation in specific situations. In such cases, it is said that the operator meets all kinds of extra costs.

Another point of emphasis is on the use of resources. Determining the use of resources is considered to be an important factor in determining the profitability level of the project. Participants in this issue, Justina commented:

I think the resources used in the project are the most important factor affecting the profitability of the project. Depending on what resources you will use in the project, we can estimate how profitable it will be. We can also predict if they will be effective as long as we have an idea about the resources.

All participants responded in a similar way to how the project costing was carried out and how it worked. Firstly, as a first step of project costing, customer expectations are compared with the fees of existing resources and the idea of the size and profitability of the project is given. The stages such as interpreter fees, calculation of the number of words to translate are considered to be the first stage of the project costing process. In this regard, Asta has included the following statements:

In our case costing is done when the project manager calculates the wordcount and tells the client that "this is the payable amount" since we have agreed rates. We just need to know the effective number of units to perform the work (words, hours). Or in many cases the clients calculate the payable amount and tell themselves to us that this is how we are going to pay. I do not see minuses to this process. Maybe only in those cases when clients send complex non-usual projects, which we have not done before - with specific instructions, with some commenting or marking needed, or some checking, researching. Then costing is difficult, riskier and time consuming, because either you have to guess, and estimate based on best judgement or past experience, or you have to ask a linguist to try the task or try yourself and evaluate the possible productivity and effort needed, and then based on that give the estimated cost to the client.

One of the participants, Asta's expression, is that it is much easier to standardize customer expectations than standard, but it is understood that complex expectations contain risks in terms of cost.

It was emphasized by the participants that the quality expectations of the customer also impacted

the cost. The quality expectations of the client are evaluated by the project management department and it is seen that the resources and the budget to meet the expectation are revealed. Participants in this issue, Justina commented:

We have a general idea by comparing the quality that the customer expects from the project and the prices of our resources that are suitable for this project. We then determine what steps are needed for this project. Sometimes it may be necessary to use an interpreter + editor + quality control engineer, but for example, sometimes it is just enough to translate without any further steps. I think the weakness of the system is that it is not always possible to predict whether an interpreter will be effective in a project.

When it comes to the question of whether it is possible to reduce costs without sacrificing efficiency in the related sector, most of the participants said it was not possible. It has been emphasized that reducing costs will lead to a number of quality problems. Costs can be reduced, especially if some staff are not employed in the project process, but this has a negative impact on quality. Aurimas, who works as project coordinator in the related company, stated that the project can be completed by working only with an interpreter but this may lead to some problems:

It's possible, but it's entirely up to the interpreters and editors working on the project. If we try to reduce the costs by reducing the number of steps we use in the localization process (for example, only using an interpreter without using the editor and quality control engineer), this creates a much more comfortable environment for the potential problems to occur. It is therefore extremely important that interpreters and editors make a quality job. In addition, we can reduce costs by using technical tools, for example by using machine translation (which we consider as a much more advanced version of google translate). But when such new technologies and software are used, the interpreters and editors who work with them should also be familiar with these tools and the process so that mistakes would not be made which could increase the overall project cost.

Aurimas stressed that initiatives to reduce project costs could lead to a situation that increases project costs in the long run; especially in the name of reducing the cost of the project to use a number of technical tools as an obstacle to the development of qualified personnel sees. This may lead to an increase in project costs by causing errors in projects in the long run.

Only two of the participants pointed out that the costs could be reduced to some extent. In this regard, Irina, who fulfills the role of production and sales manager in the company, commented on reducing the costs by drawing attention to the efficient operation of qualified specialists, qualified interpreters and an automatic structure of the project process:

We can reduce the project's costs by:

a) Working with less expensive and productive linguists;

b) Assigning the linguists with sufficient experience in the project's specialization field;

c) creating know-how and documenting the project-line (account) related experience;

d) applying process automation solutions (to process project's data, etc.), reducing the time for manual work, applying MT (machine-translation), etc.

One of the participants, Irina, seems to pay attention to the machine translation when it comes to the comment about the reducing the costs without sacrificing efficiency. With the development of machine translation and the ability to solve more complex tasks, projects can be carried out with fewer people and faster.

The answers of the participants vary regarding the role of the clients in project costing. Four of the respondents think that the clients play an important role in project costing. Two of the participants stated that the prices were standard and that customers had a concern about quality and that standard pricing policy was applied unless there was a special request. 1 of the participants did not comment.

Participants who say that the client is effective in project costing seem to emphasize the importance of customer expectations. Participants Asta gave the following statements:

They play quite a huge role in this. As we could eliminate costing if clients do it on their behalf. I.e., if they say: effective wordcount is 1000 words, then we trust and use the same figure for linguists, and get the same amount definitely paid by client. In a sense, it already happens, and costing is taken care of by the client, we only recalculate to provide figures for the linguists.

The customers themselves determine the quality conditions as well as the role of the customer in the costing phase. Customers who budget the projects are also responsible for unforeseen problems during the project.

Justina, one of the participants who argues that the role of the customers in project costing is not much, pointed out that the costs per unit are standard and that only extra cases are charged for extra cases.

In this regard, there is a certain amount of consensus among the participants. As far as the standard pricing policy is concerned, it is seen that the costing policy is also applied according to the customer expectations in the enterprise and the quality standards.

The project costing process has not responded to what other stakeholders / partners are influencing the process and 3 of the participants do not have enough knowledge to ask how they play in the process.

Given the answers, it is understood that the participants pay attention to the inter-departmental and inter-departmental stakeholders, and that there are no corporate partners of the business. It is observed that these stakeholders have a say in the costing stage that the customer and the business enterprise in the business are cooperating with the related departments. It is emphasized that departments such as human resources, project management department and sales department act jointly in project costing. On the other hand, the importance of the customers, who are one of the stakeholders of the business, is emphasized in project costing.

When you look at the industry, which factor do you think has the most importance on project cost management? How much control do you have over this factor? Regarding this question, most of the participants gave answers related to the interpreters. The most effective factors in project costing are as follows:

- Interpreter effectiveness
- Interpreter prices
- Interpreter and editorial work quality

Apart from just two participants, all participants said that the prices, efficiency and effectiveness of interpreters played the most effective role in the costing phase. The other two did not respond.

Participants Justina commented on this:

I think the most important factor is negotiations with resources. If we can negotiate with new interpreters and editors at good prices, it will directly increase the profitability of these projects. I also think that working with more freelance interpreters and editors instead of different translation companies will also increase the profitability of the project. I work with them on a daily basis, but the human resources department is always looking for new interpreters and negotiating the price.

Participants seem to agree on the impact of the cost and prices of interpreters on the cost of doing business. On the other hand, the impact of both qualifications and paid interpreters on profitability has been addressed.

Participant Asta made an emphasis on the client's importance on project cost management in localization industry and commented:

Client demands - they demand lower and lower rates due to high competition in the industry. Agencies have to compete against freelancers, who most often can offer lower rates than agencies. Due to fierce competition in the industry, the clients always have the choice of who to partner up with, which means that we need to offer lower prices and better quality, and this directly effects the costs of the project.

It was observed that the most important factors in project costing in translation and localization industry are:

- Linguist's Rates (prices): Participants indicated that each project and client have different quality expectations, and depending on these expectations the appropriate linguist, editor and the QA engineer is selected for the project, which is the foundation of project costing in this industry.
- Agreements with the clients: It was indicated that the company UAB Synergium has different price agreements and technical agreements with each client and for each language combination. Depending on which language combination is requested from which client the company and the effective wordcount, the approximate budget for the project is calculated which forms a basis for the company to proceed to the project costing.
- The number of processes: Participants noted that for each particular project, the number of steps that are required in order to deliver a final quality translation that is free of errors changes. It was inferred that for some projects only working with an interpreter is enough

while for others it is necessary to add additional steps such as editing, quality assurance and proofreading which increases the overall budget of the project. Thus, the number of processes have a direct effect on project costing in localization industry.

CONCLUSIONS AND RECOMMENDATIONS

In parallel with the increasing needs in the last years, the concept of projects has become well integrated into our life with the growing and complicated structure. The project is a process involving uncertainty and risk, using a variety of resources, such as people, materials and technology, which are a specific aim and financial resource. Project constraints are scope, time, performance and cost. Under these constraints, project management aims to use the resources most effectively and to complete the project in the shortest time and with the least cost.

Project management techniques aim to solve the problems that can be encountered throughout the life of the project by simplifying them. These techniques provide a certain perspective on the project. In this way, projects become certain written formats and are easier to control.

Project planning techniques are used to plan projects and to check program suitability afterwards. These techniques ensure that projects are tracked according to their plans, the deviations that occur during the life of the project, the causes leading to these deviations, and the prevention of problems. At the application stage of the project, some activities may be ahead of schedule and others may be behind. In this case the resources used are balanced as necessary to keep the cost of the project at the planned level.

Project costing is an important process in project management in service sector due to the fact that there are many factors that influence this process and it is of crucial importance to determine how these factors affect the costing process. The service sector case is different than production sector in a sense that the inputs such as human resources and customer expectations fluctuate and change depending on each individual project. It was observed that different clients have different quality expectations from projects which is why it can be concluded that it is not effective to implement one project costing method for all types of projects and clients. Different methods should be used for dealing with different customers expectations, projects and project teams. When the scope of the project scope is big, the customer quality expectations are high, and the budget is relatively big methods such as cost-benefit analysis and net present value could be used because such projects have the utmost importance for the company to remain competitive in the industry where the level of competition is high. These projects determine whether the company is capable of undertaking demanding projects with big scopes, which is provides the main source of revenue for the company and thus for such projects the decision makers need more concrete data to make a beneficial decision for the company. For projects that are smaller on scope and have less demanding clients, non-financial methods such as checklists could be used because they are less costly, easier to perform and does not require an in-depth analysis of the situation, which is not necessary for such projects.

Looking at the data obtained within the scope of the research in UAB Synergium it is seen that the company determines the prices to be paid to the resources and resources primarily in project cost determination. At this point, expectations of customers seem to be important. It is seen that customers' expectation of quality affects the type of resources that will be used in the project and that customers determine their project budget in this sense. Thus, it can be concluded that customer expectations and agreements are the most important factors in project costing in localization industry.

It appears that many departments are involved in project cost management of the relevant company. Among these departments, the project management department is seen as the decision-making department. It seems that departments such as human resources and sales marketing also play a role in project costing process. It is a common thought that reducing the company's project costs will create some worries about quality in the face of the customers and company executives. Therefore, reducing the project costs in the localization sector can bring up some problems and increase project costs in the long run. It appears that in order to reduce the costs in the related sector, the input factors such as translators or editors must be providing quality work that is in line with the customer expectations. Therefore, the quality of work that is provided by the resources such as translators and editors are seen as the second most important factor in project costing in this industry.

It concluded that the most important factors in project costing in the related sector is the customers and their expectations and the prices of the resources that change depending on the project, requirements and the requested language combination. Therefore, the project budgets are determined by the customers according to their own quality standards and how willing they are to undertake the problems that arise during the project phase. It seems that the project costing management of the related company is similar to the action-based costing method in this respect. Thus, it can be concluded that project costing in translation and localization sector do not have an effect on the profitability as the process is mostly pre-defined and the prices are already agreed upon.

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