



**ADDIS ABABA UNIVERSITY**  
**SCHOOL OF COMMERCE**  
**GRADUATE PROGRAM MA IN PROJECT MANAGEMENT**

**CRITICAL SUCCESS FACTORS FOR**  
**ADDIS ABABA CITY GOVERNMENT HOUSING**  
**CONSTRUCTION PROJECTS**

**By: AFEWORK NIGUSSIE ADMASSU**

**FEBRUARY, 2019**



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## **DECLARATION**

I declare that this is my work, and that all source materials used for the thesis have been duly acknowledged.

Name: \_\_\_\_\_

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Place: Project Management Program Unit in the school of commerce, college of business and Economics, Addis Ababa University



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## ABSTRACT

The construction industry is dynamic in nature due to the increasing uncertainties in technology, budgets, and development processes. Nowadays, building projects are becoming much more complex and difficult. The project team is facing unprecedented changes. The study of project success and the critical success factors (CSFs) are considered to be a means to improve the effectiveness of project. Effective management of housing construction projects is becoming increasingly important for sustainable housing to remain competitive in today's dynamic business environment to the satisfaction of the resident of the city government of Addis Ababa. The purpose of this study is to identify a list of success factors significant in housing construction projects and to investigate possible interrelations between success factors in housing construction projects in Addis Ababa. The research findings will be expected to assist the city government of Addis Ababa responsible organization in evaluating the performance of their housing construction project management.

**Key words: Housing construction, success factors, success factors interrelation, project management, Addis Ababa.**

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## CHAPTER ONE

### INTRODUCTION

#### 1.1. Background

Established in 1886 and with more than four million populations, Addis Ababa is one of the oldest and largest cities in Africa. The population of Addis Ababa will rise to 12 million in 2024 (UN-HABITAT, 2008). Its geographic location in the centre of Ethiopia, combined with lack of development policies in other urban centres has given the capital the majority of social and economic infrastructure in the country. As a result, it has been a melting pot to hundreds of thousands of people, coming from all corners of the country in search of better employment opportunities and services. This high rate of rural urban migration accounts for about 40 percent of the growth. Coupled with rapid natural population growth, Addis Ababa one of the fast growing cities in Africa, posing critical challenges, including high rate of unemployment, housing shortage and environmental deterioration (UN-HABITAT, 2008).

The construction industry is one of the most used examples of project based industries. It might be characterized as complex, cost and time consuming and risky. However, construction projects are also dynamic and challenging which attracts capital, new technologies and brilliant brains. Housing building projects particularly represent one of the largest sectors of the construction industry in the most developing economies of the world [Ahadzie et al., 2008].

Project success criteria are seen as a result area which organisations must focus on in order to manage projects successfully [Westerveld, 2002]. Traditionally, project success has been seen by the PMI's iron triangle of cost, time and conformance to requirement (quality). In recent times many research have proved that this is not a satisfactory success criteria and more is required beyond this. The reality is that the notion of success is a much more complex issue and often an illusory construct [Westerveld, 2002].

Several efforts have been made through research to evolve and predict some project success criteria for project management in both developed and developing economies, but the degree of originality and peculiarity of conditions, uniqueness of projects and problems and prevailing different objectives in many countries make their wholesale adoption and application of little

effects and benefits. It is thus suggested that a more 'local' approach to establish these success criteria aimed at improving the benefits from the application of project management thus registering developments and standards aimed at informing policy makers and stakeholders in their decision and policy framework is advised [Ahadzie et al, 2007].

A significance of project success factors might be proved by a number of studies completed in this field during last half a century. The evolution of views promotes a search of new perceptions almost every new decade starting from first researches in 1960s. Both academicians and practitioners agree on a necessity of knowledge development in this area due to its practical impact on resource allocation process and managerial tools application.

In the past, research on project success focused on the achievement of the iron triangle objectives (time, cost and quality) until recently researchers have identified the need to widen the criteria for measuring project success (Atkinson, 1999; Wateridge, 1998). Researchers such as de Wit (1988) emphasize that a project is considered successful if its stakeholders are generally successful and the projects technical performance specification has been achieved. Muller (2007) states that projects differ in a variety of ways such as size, uniqueness and complexity this has led researchers such as (Westerveld 2003) to state that the criteria for measuring project success should vary from project to project and hence it would be difficult to have a unique set of criteria for all projects in all industries.

## **1.2. Statement of the Problem**

Housing is one of the basic necessities for human survival; despite it remains for long period as a critical problem of most of the cities of developing countries.

With this regard the Addis Ababa City Government invested in hundreds of billions birr in the last fifteen years since 2004. However, the investment from the city's limited resource for the mass housing construction it is not successful compared to the traditional project success evaluation criteria. It is known that, the housing projects were not delivered with the scheduled time, estimated budget and with the expected minimum quality requirements. This fact is witnessed by the city so far execution of the housing development in numbers stated are up-to-date since 2005 more than 332, 000 mass housing is developed and out of these houses completed and delivered is counted around 180,000 only. But the registered city residents both in 2005 and 2013 are more than 1.2 million. Which shows that there are still around 868,000

back logged houses that construction is not started (Addis Ababa Housing Development and Administration Bureau, 2018).

To date the city administration is challenged in successful mass housing construction and delivery to the registered beneficiaries that hinder its endeavours. However, the high percentage of urban slum dwellers coupled with 8% population growth bring a significant challenge for Addis Ababa in providing affordable and adequate housing. This is due to the pressure it creates on the availability of affordable land and construction materials, access to finance and urban management coupled with project successful completion body of knowledge, tools and techniques identification and practice.

In Addis Ababa, the government is the key player by providing mass housing. The government of Ethiopia is implementing Integrated Housing Development Program (IHDP) since 2005 (World Bank, 2015). But it has been criticizing on its success in terms of the beneficiaries' expectations, affordability and others aspects. With data the annual growth rate of the city has been estimated in recent years to be 3.8%. In prior years, growth has been as much as 8%. The city is home to 23.8 percent of all urban dwellers in Ethiopia, and has an estimated density of 5936.2 per square kilometer (New World Encyclopedia, 2016). Addis Ababa already has serious housing problems, evidenced by the current high proportion of urban slum dwellers, 79.1% (UN-HABITAT, 2011).

The Center for Affordable Housing in Africa 2013-year book by referring a 2007 survey stated that "in Addis Ababa alone, the demand was between 35,000 and 45,000 housing units to be supplied annually for 10 years to replace the existing (70%) dilapidated stock as well as cater for new household formation. At the current rate of supply, even with the progress of government housing programs, this is unlikely to be met, especially in the middle to lower income bands (Kecia Rust and Lucille Gavera, 2013).

There is still a lack of understanding what really contributing success factors to Addis Ababa mass housing development project success criteria by analysing specifically to its nature considering the dynamic nature of construction industry, the number of mass housing projects and rapidly changing environment of Addis Ababa.

Therefore, research aims of this study is to identify a list of success factors significant in housing construction projects in Addis Ababa and also to investigate possible interrelations

between success factors in housing construction projects that the Addis Ababa City Government should emphasize the influential success factors in its mass housing construction development endeavours.

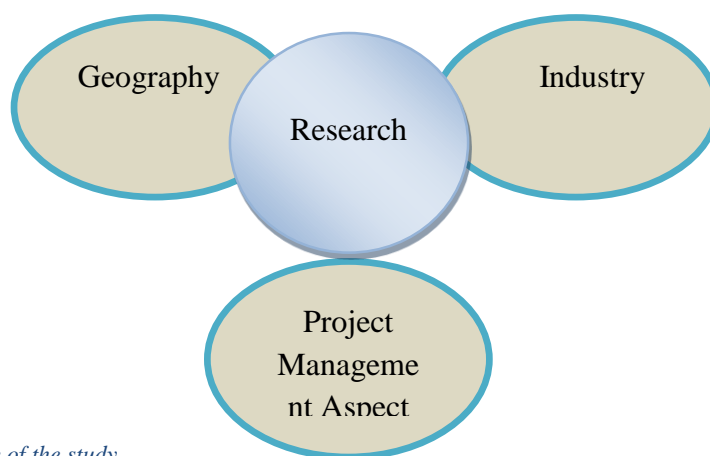
### 1.3. Significance of the Study

1. Findings of the research will be provided to Addis Ababa City Government Housing Construction Projects and other stakeholders to assist them in understanding the critical success factors of their housing projects.
2. Thesis findings would assist them design interventions to help them improve their project management. The findings will also help the Addis Ababa city Municipal office as an input to solve the housing shortage of the city.

### 1.4. Scope of the Research

As already indicated in the section above, this research mainly deals with success factors analysis in the project management knowledge area. However, since this area is quite broad this sections aims to provide clarification on the extent of the current research.

The scope of the study is bounded by three main characteristics as schematically shown in



*Figure 1. Scope of the study*

In terms of geography coverage this study is dedicated to one single city – Addis Ababa. Since the most majority of housing constructions is located in Addis Ababa and I assumed the findings of the current research can be utilized in the other part of Ethiopian cities.

Only managers who work in this city participated in the survey. None of the interviews or questionnaires was conducted in other locations.

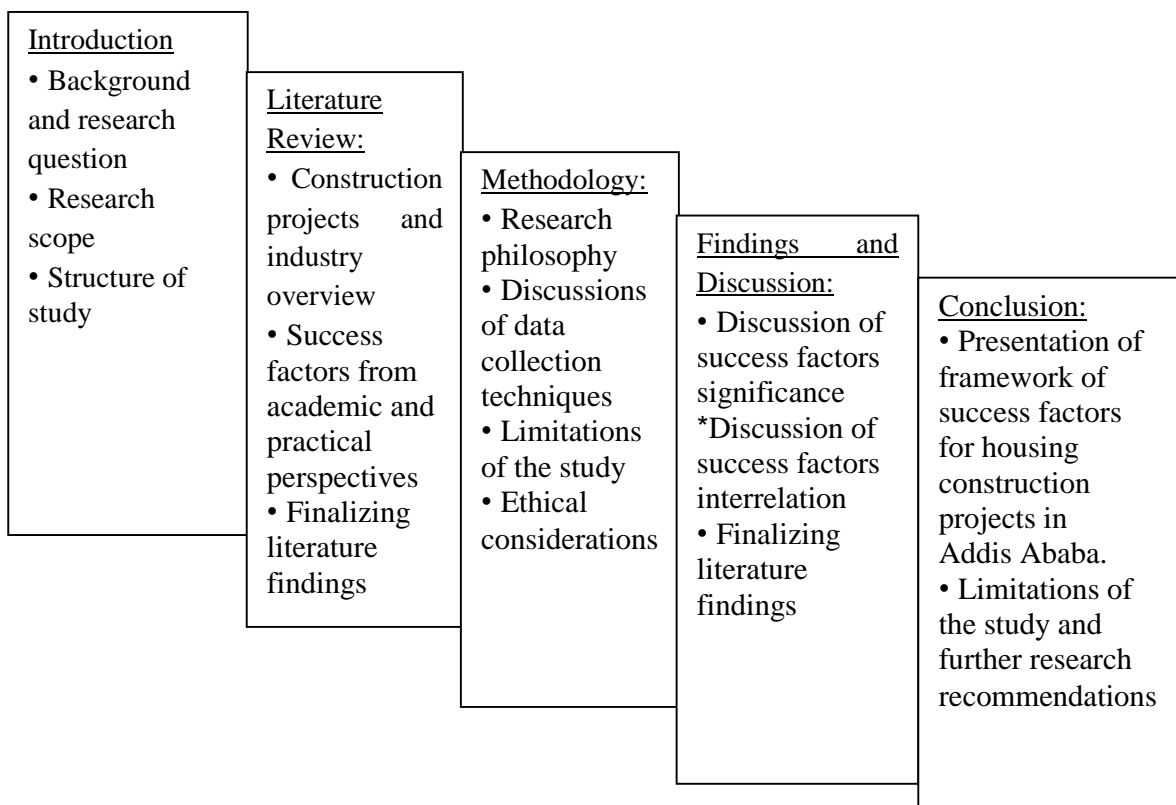
Housing construction industry the choice of which will be grounded in the following section is the second boundary of research scope. This specific section excludes other types of construction projects like civil engineering or industrial construction as well as all other types

of projects as the main focus of this study aims on housing success factor identification even though other types also helps to comparison.

In addition, project success factors were chosen from different project management aspects as the main focus of the study. Regarding this area, the scope of the research is limited to identification of the most important factors for project success as well as finding relationship among different success factors those are listed in Appendix 1.

Therefore, current research makes an effort to identify which of the factors have the highest on housing construction project success in Addis Ababa.

### 1.5. Structure of Study



*Figure 2 Structure of the study*

Thus, Introduction presents brief overview of research problem and formulate research question. Literature review reflects success factors from academic and practical fields and construction industry overview. Methodology describes the multi-method approach to research design. First of all, it covers some aspects of research philosophy followed by data detailed analysis of collection techniques applied in present study in order to achieve sufficient results. Limitations and ethical

aspects of research method are discussed in this chapter as well. Findings and discussion section is focused on data analysis and discussion on importance of factors in Addis Ababa mass housing constructions. It also provides study of interrelations between factors. Conclusions summarize achieved results, formulate limitations and eliminate areas for possible further studies.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

This chapter presents the related literature on the study. The chapter is presented under the following sections:

#### **2.1 Construction Projects.**

Originally construction project has specific properties and additional constraints in terms of specifications, project duration and processes (Drewer, 2001). Being dynamic, construction industry includes a wide variety of stakeholders, developed procurement system and not always customized product as an outcome of project. These aspects make it distinctive from other industries and to a certain extent incomparable to them (Toor, Ogunlana, 2008). Regarding this sort of uniqueness attributable to construction projects it seems likely specific success factors should drive these projects to success. Moreover, Liu (1999) accentuate that due to particular environment conditions, specific priorities in goals and project type, even each project has its exceptional list of success factors which cannot be easily implemented for another project. Adding to this, Jaselskis and Ashley (1991) discuss another perspective, they claim that common factors identified for various types of projects might contribute to each particular project differently.

However, in spite of the fact that construction industry differ from production or service there are still number of common project characteristics which might be applicable in others too. Invariably construction projects also deal with human, technical, financial issues which remain the same for any other field (Toor, Ogunlana, 2008). Thinking about project as a mechanism it seems obvious that each project needs incoming parameters, processes and outgoing results. Therefore, it looks probable that there is a list of success factors applicable for majority of projects regardless their unique features.

#### **2.2 Housing Construction Industry in Addis Ababa**

In Addis Ababa housing now a day has become one of the complex problems and unless urgent measure is taken both at the regional and the federal levels to mitigate the housing problem, it will cause crisis on the economic and social development. The demand for housing and strong future demand indicate the need for residential real estate development and the expansion of infrastructures in the city (World population prospects, 2015).

The majority of the houses in the current slums of Addis Ababa are dilapidated. The existence of houses which are severely damaged coupled with scarcity of houses had provoked housing problems of the city. The number of housing units available in the city in year 2002 was about 60% the housing needed by the residential or backlogs of about 230,000 housing units (Alemayehu, 2008). In addition to the house backlogs in 2002, the demand of the dwellers for residential houses increasing by 10,000 annually and that makes the situation more severe (AAHDPO, 2007). In response to these problems, Addis Ababa city government has been trying to improve the dilapidated inner city slums as well as to reduce the house backlogs under the grand Housing Program (GHP) to meet target 11 of the millennium Development Goal 7, of Cities without Slums. It is commonly known as condominium housing.

Particularly housing building, representing one of the largest sectors within the construction industry, nowadays grows fast in Addis Ababa. Ahadzie et al. (2008) define housing constructions as ‘design and construction of speculative standardized house units usually in the same location and executed within the same project scheme’. There are number of variables that make housing constructions different from any other traditional building project. Muhlemann et al. (1992) stress a non-customized design and a necessity for production time between stages which involves a delivery of house-units. Moreover, a large-scale of housing construction projects requires a more complex and difficult management comparing to other construction projects (Mahdi, 2004).

The government of Ethiopia and the City Administration of Addis Ababa have taken housing as the most important issue to be considered from its social, economical, and environmental perspectives. The current Urban Development policy and Housing Development Strategy of Ethiopia recognizes the synergy that housing creates in the overall development and has made a strong commitment to address the housing need, particularly that of the low and middle income group of the society.

The National Housing Strategic Framework that is derived from the Urban Development Policy Clearly puts the following strategies to address the housing challenges through integrated housing development program (IHDP);

The integrated housing development program was introduced as a government led intervention to implement the first strategy indicated earlier. To this effect the city administration established a project office called ‘The Addis Ababa Housing Construction Project Office (AAHCPO) since 2004 to implement the IHD Program (10/90 & 20/80 Scheme) and since

2014 established Addis Ababa Saving Houses Development Enterprise (AASHDE) to implement IHD Program (40/60 Scheme). These three schemes are briefly discussed as follows,

Housing Project 10/90 is designed for most low income group 10 percent of the payment will be down payment by the beneficiary while the rest 90 percent loan from Commercial bank of Ethiopia will be paid through installment within 20 years. Housing Project 20/80 is the 20 percent of the payment will be down payment by the beneficiary while the rest 80 percent loan from Commercial bank of Ethiopia will be paid through installment within 20 years. Housing Project 40/60 is 40 percent of the payment will be down payment by the beneficiary while the rest 60 percent loan from Commercial bank of Ethiopia will be paid through installment within 10 years.

As of the IHD Program commencement the city constructed and transferred mass houses totaling more than 176 thousand house hold units benefiting a total population of more than 800 thousand. Currently 132,354 household units are under construction with a target set to construct 50,000 houses each year. Furthermore, city wide dramatic improvement has been achieved in provision of infrastructure and services. Cross subsidy to cover the cost of land lease on which the mass housing construction value compensation is by selling shop units on the resident buildings to private sectors via open bids (Addis Ababa Housing Development and Administration Bureau, 2018).

### **2.3. Conceptual Review**

Cooke-Davies (2002) finds two critical distinctions that have to be discussed on the beginning of studies devoted to critical success factors in projects.

The first distinction lies in between ‘project success’ and ‘project management success’ definition (Figure, 3) Baccarini (1999) also makes a contrast between these two terms stressing that until clarification in concepts will be reached it is difficult to find a measure of project success and therefore to anticipate project outcomes effectively. Thus, De Wit (1988) and other authors assert that project success mostly relates to general project objectives and to a level of attainment of these objectives. In contrast, project management success refers to traditional approach of evaluating project against time, budget and quality criteria. Nowadays measurements of project management success, referring to classic triad of cost-quality-time performance, are broadly discussed in literature from both theoretical and practical prospective (Chan and Kumaras wamy, 2002; Chua et al., 1999).

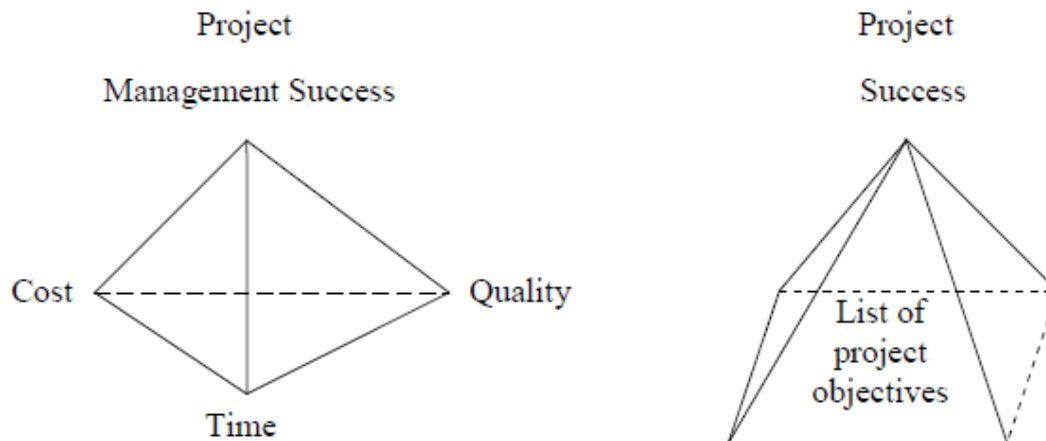


Figure 3 Project success' and 'project management success' distinguish

The second distinction pointed by Cooke-Davies (2002) eliminates a conceptual difference between 'success criteria' and 'success factors'. He stresses that success criteria belong to specific measurement which needs to be formulated in order to conclude whether project succeeds or fails. However, success factors are more about particular levers that can be used by project manager to increase a probability of successful outcome of a project. Success factor as a term itself was defined by Sanvido et al. (1992) as it was claimed by Rockart (1979) as a 'factor predicting success of project'. In addition in his paper (Rockart, 1979) success factors are identified by the following attributes:

- '... the limited number of areas in which positive outcomes will guarantee successful performance...'
- '... the key areas where 'things must go right' for the business to flourish',
- '... the aspects of business that should be highly attendant by management', and
- '... the areas which needs good performance to ensure achievement of goals'

In spite of an obvious gap between concepts of success factor and success criterion, a direct connection between them still exists. Numbers of studies raise a question of a bottleneck in researches in this area related to a success judgment. Discussing success factors it would be logical to address a definition of project success which in turns is caused by success criteria. Chan et al. (2004) also emphasize a problem of poor identification of project success in the minds of project managers which causes ambiguity for studying this area.

Westerveld (2003) in his study tries to link success factors to success criteria using Project Excellence Model adopted from EFQM-model. EFQM-model was developed by European Foundation of Quality Management in order to synchronise processes of quality measurement and improvement in Western Europe. Generally it embraces two aspects: performance of the

organization and its internal management. In his research Westerveld (2003) finds a connection between project result area and organizational area, in other words he describes a way to combine success criteria with success factors into one coherent model. His research includes findings of a case study illustrating how the model could increase a project performance. Another study was generated by Toor and Ogunlana (2008) which also distinguishes critical success factors, as an evaluation of project management system performance, and key performance indicators, as a final performance measurement.(Figure 4) illustrates clearly this approach.

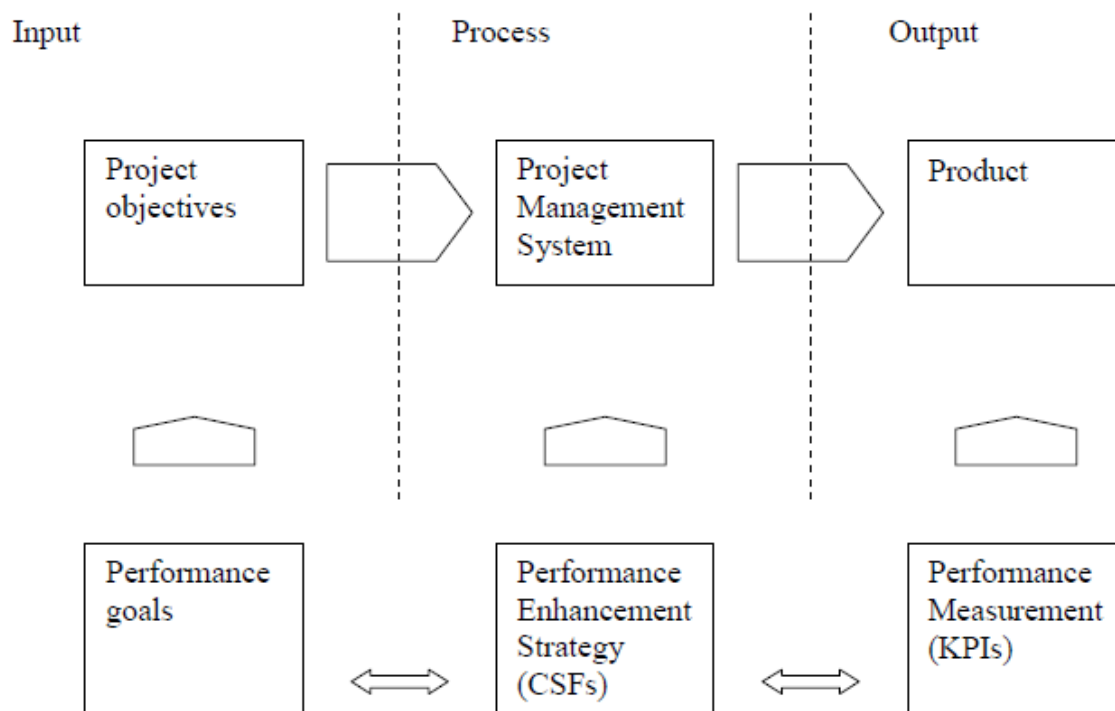


Figure 4 Difference between critical successes factors (CSFs) and key performance indicators (KPIs)

Source: Toor and Ogun Lana (2008)

In addition, Chua et al. (1999) identify cost, quality and time as ‘major goals’ in construction projects and state that there are factors which lead project to success in terms of those objectives. They produce a hierarchical model for construction project success (Figure 4) which clarifies inter-positions of performance indicators against success factors. Budget, schedule and quality performances in this model represent ingredients of the main goal of construction projected to be finished successfully. This model is a part of research findings and therefore project aspects occupied the third level of model are defined according to authors point of view. Also it is assumed that each of clusters which are arranged at the bottom level of model combines a set of critical success factors united together basing on their similar nature.

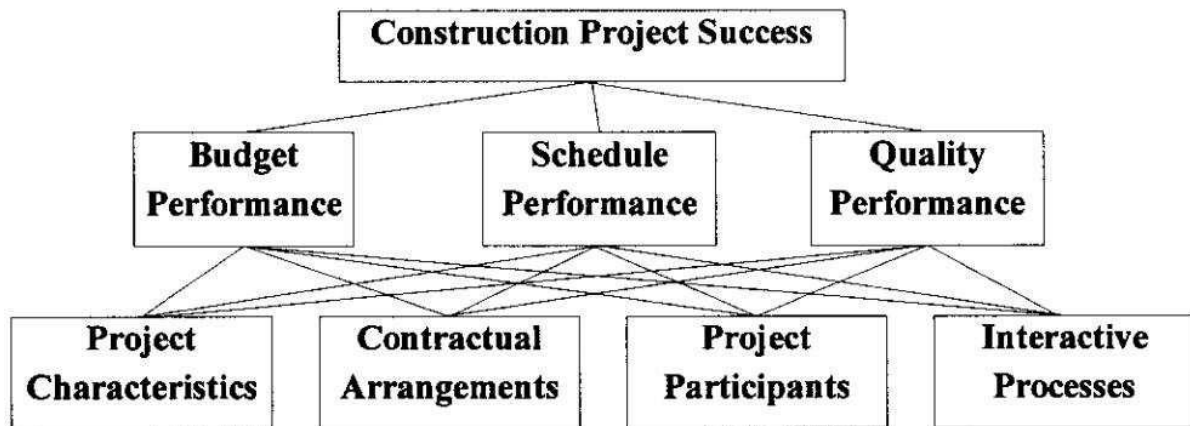


Figure 5 Hierarchical Model of Construction Project Success

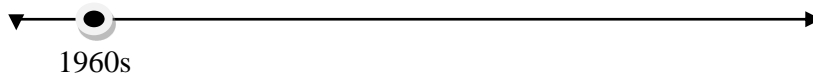
Source: Chua et al. (1999)

Although time-, quality- and cost-based measures are common used performance indicators they are debatable. Thus De Wit (1988) claims that described measures can be good and effective characteristics for production system for a short-run period. However, long term success implies benefits for stakeholders, stakeholders' satisfaction. Also, Chua et al. (1999) point safety consideration as additional major goals for construction projects.

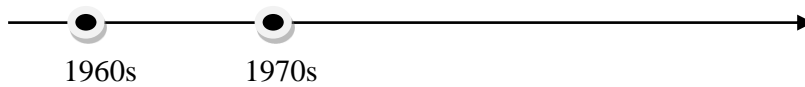
In contrast, other authors believe that cost, quality and time indicators, which are likely performance measures, might be declared as success factors. Thus, Chan and Kumaraswamy (2002) address their attention to investigation of construction project duration issues due to time importance in project success. It appears contradictory to the following part of their research as later authors produce number of factors affecting project duration. Therefore, it shows that a border line in conceptual differences between success factors (variables drive project to successful outcome) and performance indicators (measures of execution) remains uncertain.

#### 2.4. Theoretical Perspective Project Success Factors

The investigation of factors which might contribute to a successful project performance is critical in order to notice attention to specific areas of improvement. Numbers of studies over different geographic areas seem to contribute significantly to the body of knowledge in construction project performance during the past three decades (Chan and Kumaraswamy, 2002). In spite of various similarities among findings there is no agreement between authors on final list of success factors.

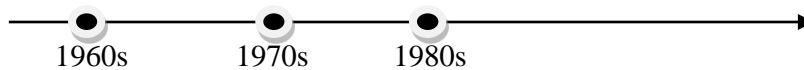


Initially researchers investigating success factors in project management concentrated their attention mainly on planning and control techniques (Belassi and Tukel, 1996). Authors conjectured that improvement of scheduling techniques and development of monitoring and control tools would have positive reflection on project outcome. One of the first publications examining success factors appeared from Rubin and Seeling (1967) study where project manager experience was discussed in terms of project success and failure. Mainly they address duration of project manager experience and scope of projects that were managed by him.



Next decade starts with the study of Sayles and Chandler (1971). It follows previous trend and recognizes scheduling, monitoring and feedback, and control systems as dominate factors on the way of successful project completion. In spite of the fact that final set of factors seems to be a duplication of previous researches, authors also introduce project manager's competence as a success factor. They emphasize that being a key person project manager contributes in a project success demonstrating his/her skills and knowledge.

Martin (1976) also gives a priority to plan, control and review techniques equally with general management support as it was agreed by his predecessors. However, his study contributes to success factors identification process by emphasizing such categories as project organizational philosophy, organizing authority, project team selection and resource allocation. Although, first two factors seem vague in terms of evaluation (i.e. which organizational philosophy leads to failure and which one increase a likelihood of success) project team factor provides a new view of the problem shifting attention from planning techniques to human behaviour.



Later views in this area stressed that being over focused on standard tools is not efficient and does not provide a relevant understanding of success. New studies (done by Morris and Hough (1987), Pinto and Slevin (1989) and others) eliminated other factors which should be taken into consideration while managing projects successfully.

Cleland and King (1983) came out with a list of 13 factors affecting project success. Among well-known drivers, like planning and scheduling, this study points other important levers which might

be grouped basing on their relation to project area (project summary and project review), human area (client characteristics, training of executives, and manpower capabilities), and general management area (top management support, financial support, logistics requirements, and acquisitions). In addition, authors consider information and communication channels as critical important factors in project positive outcome. At the same year Baker et al. (1983) produce a research on success factors in projects. Their findings seem similar to Cleland's and King's (1983) conclusions. Most similarities lie in a field of general management and project objectives where authors pay more attention to financial implication as an accurate cost estimation, budgeting and adequate project funding. Moreover, they investigate human ingredient pointing project team qualification and project manager competence as the main factors but at the same time stress a necessity of task rather than social orientation. In addition, goal commitment focus still dominates among other factors and therefore planning and control tools make a priority in a list of factors. Generally, at this period of time human factor seems to be in embryo stage of development. Attention to social component flourishes in solid research with a long list of factors only, however more frequently human side that contributed to a project success, seems to be neglected.

After Cleland and King (1983) Locke (1984) also indicates a necessity to clarify communication channels and procedures stating that it will also have an impact on progress control efficiency. Following findings of studies in 70s he also marks out a significance of project manager's competences and authority in project success. Furthermore, Nahapiet and Nahapiet (1985) found their research basing on analysis of different building construction projects in United States and Great Britain. This comparative study particularly addresses management and organizational aspects as success factors.

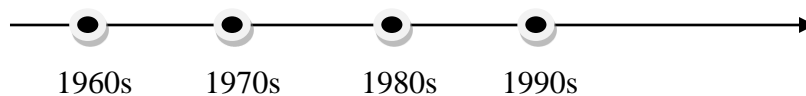
Also Morris and Hough (1987) after examination of eight complex projects which had a great economic influence and at the same time failed came with a conclusion that the reasons of failure related to a poor project management in general. Authors indicate success factors basing on empirical studies and generalize them into seven dimensions. Morris and Hough (1987) conclude that although stated factors were selected from large projects experience they might also be applied for general projects. Moreover, Morris (1986) states that good communication; client relations and qualified project team deserve more attention due to their highly possible impact on project success.

In addition, one year before Hughes (1986) published his research about projects failures. In this study he concludes that major of projects fail due to overall improper project management done by rewarding wrong actions and unrealistic objectives. An importance of clear and reasonable project

goals become one of the most referred success factors in this decade. Although findings of this paper seem similar to Morris and Hough (1987) conclusions, they also include lack of communication of goals as an important characteristic of unsuccessful projects.

Although, Pinto and Slevin (1989) in their study pay their primary attention to research and development projects, they concluded with a list of success factors regardless project type. In their paper authors refer to the top recognized success factors starting from 60s: to an importance of top management support and monitoring techniques stated at 60s, following by significance of project manager competences declared at 70s and finally to a necessity of considering personnel power and communication channels defined in 80s. A unique contribution of their paper can be classified into two dimensions. Firstly, this study seems to be the first attempt to find relations between success factors and to investigate factors' relevance according to each particular stage of project life cycle. Secondly, authors accentuate on client factor which is as important as project manager due to a close connection to project and ability to initiate changes.

However, in spite of appeared clarity in basic fundamentals there are still some other studies focused on project management success analysis rather than on project success as a whole (Might and Fisher, 1985).



Walker (1995) single out a project scope as a factor affecting project duration and therefore influencing on project success. However, project scope is not the one factor related to project characteristics. Thus, Akinsola et al. (1997), Songer and Molenaar (1997), Belout (1998) also depicted type of project, project complexity and size of project as influential project related success factors.

Moreover, procurement factor is also introduced in this period. Its importance increased after studies of such researchers as Pocock et al. (1997), Kumaraswamy and Chan (1999), Walker and Vines (2000). In one level with procurement a tendering factor becomes popular. By defining tendering as a success factor Dissanayaka and Kumaraswamy (1999) stress a necessity to pay more attention on selection of main contractor(-s) and defining a project team.

Project manager as a one of key force affecting project performance is also analysed from the success factor point of view. Particularly project manager's experience, commitment, competence

and authority were discussed as factors influencing project success by Chua et al. (1999). However, project management tools and mechanisms attract more attention of researchers rather than personal features of project manager. Among critical project management tools Belout (1998), Walker and Vines (2000) specify communication, feedback capabilities, and decision making effectiveness. Furthermore, Jaselkis and Ashley (1991), Belassi and Tukel (1996) also recur to planning, monitoring and control mechanisms which seem to be classical factors since the 60-s when they were initially declared. Although, majority of factors related to project management refers to specific techniques or abilities some author indicates organization structure and safety and quality assurance program as success factors connected to project management within the enterprise (Walker and Vines, 2000). However, it seems unfounded whether it is possible to adopt organization structure, for instance, to each project in order to increase a likelihood of success occurrence.

Along with debates about project manager's abilities, skills and tools (s)he applies in managing of projects, other project participants attract attention as well. Several studies are especially focused on such key players as client, contractors (including sub-contractors), consultants, suppliers and manufacturers. Thus, Walker (1995) points that client has extreme influence on project results and can have direct impact in project duration area. Specifically, Songer and Molenaar (1997) emphasize client's power to make critical changes in project with a reference to client's type, knowledge and experience, confidence in the construction team and client project management. Moreover, Munns and Bjeirmi (1996) emphasize relations with client as one of the main dimensions of stakeholder management. From literature review it might be seen that the process of success factors research might follow different directions. It might be forward which aims to receive a set of project success factors and is built in a way to obtain the target. However, it also might be backward which implies an identification of key performance indicators and based on that list to develop a set of factors that might have influence these indicators. Thus, Wateridge (1995) and Turner (1999) state that project results should satisfy client and/or user defining it as a criterion of project success and then specify an importance of client/ user involvement into a project implementation process as a success factor; in this way demonstrating backward approach.

Contractors and sub-contractors are also directly involved in construction projects and can easily exert on their final outcomes. Main variables which were marked out in researchers as those affecting projects results are (sub-) contractor's experience, site management, financial stability and speed of information flow (Chan and Kumaraswamy, 1997; Dissanayaka and Kumarasswamy, 1999).

Furthermore, Cash and Fox (1992) separate a 'champion' role as a critical factor for overall success of the project. Study of Martinez (1994) and others also mention this type of role naming it 'committed sponsor'. In addition, Jang and Lee (1998) in their study on success factors in consulting industry claim that project champion has a big power and can influence project success directly.

In spite of number of differences in characteristics among all project key players team spirit and collaboration between them are the common attributes which contribute to a project success. In addition, team effort, according to Hassan (1995), is a critical ingredient of successful project performance. Furthermore, Larson (1995) also marks out an importance of collaborative work between project owner and contractor. His study accumulates experience of 280 construction projects and a primary focus also lies in partnering between project key players. He stresses that only 'working together as a team' with clear objectives and procedures can ensure effective problem solutions and increase a probability of success. In addition, Chua et al. (1999) specify interactive processes with project key players as a main project success driver.

The last but not the least set of success factors belong to environmental issues Environmental factors are considered as external forces which can influence project in either positive or negative ways. Different authors refer particularly to social, political and technical systems (Akinsola et al., 1997; Kaming et al., 1997). Chua et al. (1999) in analyzing typical construction project environment among listed above external factors also mention adequacy of funding and site limitation and location. They also claim that there are some critical internal project characteristics such as project size and pioneering status; where last is defined as 'if project's technology is new to the project team'. Other environmental factors would be discussed in details below.

In spite of a new wave of thinking and new views appeared during this decade it seems likely there is no complete refuse of results and findings made before 90s. Evolutional growth of thought in area of project success factors shifts focus forms one aspect to another. However, some authors among new approaches as stakeholders' management and project characteristics also are loyal to old principles like detailed planning, control and monitoring (Belassi and Tukel, 1996).

Furthermore, another trend could be found in this period of time. It seems likely that after three decades of studies in project success factors field and after numerous of researches have been published, 90s also brought another perspective of thinking. Authors start primary focus their attention not on development of new lists of factors but mostly on factors classification and grouping. It seems likely that previous papers already grounded a solid basement for further

analysis. Findings collected from earlier investigations seem to require a systematic approach to consolidate obtained results and to find possible interconnections among them.

Thus, Belassi and Tukul (1996) come out with four main areas of critical success factors related to: project, project manager and a team, organization, and external environment. Apparently, project related factors refer to project size and project life cycle, when project team addresses competences and skills of project key players; organization group combines top management support and organizational structure while environmental cluster involves political, economic, social and technological issues. The fact that client and subcontractors are attributed to environmental group (as well as competitors) rather than to project team could demonstrate that idea of partnership between key players working on the same project was not recognized by many authors in the middle of 90s. Main interest of such categorization belongs to clarification of possible inter-relations between success factors and factors' criticality with the respect to particular industry. Authors state that there are numerous of connections among groups of factors which deserve more attention from the side of researchers in order to evaluate possible impact of these factors on project results.

In addition, following main focus of this decade Chua et al. (1999) express their attention to project parties' roles. They assign project manager competence and authority; client's personnel and top management support; contractor's team competence and level of service; and other project players (consultants, suppliers, subcontractors) characteristics to a group of success factors named as 'project participants'. However, due to subjective character of classification process, different understanding of meaning of each particular factor and first attempts in categorization process it seems that group names and factors falling to these groups accordingly, are mixed up. For instance, authors address political and economic risks, location and impact on public in project related group rather than environmental category and at the same time they indicate clear objectives and adequacy of plans as contractual agreement instead of project issues.



During the last decade significant amount of studies related to project success factors in construction industry was introduced. Also it might be interesting that number of these researches were produced within developing countries (Chua et al., 1999; Mbachu and Nkado, 2007). New century researches are developed in a fashion of previous decade: most of them are concentrated on classification process.

Thus, Chan et al (2004) summarizes factors dispersed in previous studies and classified findings in groups of factors related to:

- Project,
- Procurement,
- project management
- Project participants, and
- Environment.

To the project-related category Chan et al. (2004) ascribe mostly project scope and type of project, however, another factors are also generalized by this category by many authors. For example, Yu et al. (2006) ascribe clear objectives and realistic budget to this group. They stress (as well as Fortune and White, 2006) that clear articulation of goals and priorities would help to overcome ambiguity of project successfully. Although this research is focused on construction project briefing, findings refer to the factors valid for other stages of project as well. Another study in construction projects developed by Chan and Kumaraswamy (2002) declares project scope as one of the main components affecting construction duration and therefore project completion in time.

Procurement as a success factor (or group of success factors) seems not to be broadly recognized among other authors. Under this cluster Chan et al. (2004) put selection of organization for the design and construction of the project and procedures adopted for the selection of the project team generally and main contractor particularly. Apart of this, CEEC's and KPMG's (2008) research on construction industry claims procurement as the second priority in a list of investment areas for 2008-2009, disclosed by construction companies. It stresses procurement processes' significance especially for construction projects. Although these factors were mostly investigated in 90s, publications dated as 2000s address them to other groups. For instance, Fortune and White (2006) refer procurement and contractor performance to a resource group; and at the same time Chan and Kumaraswamy (2002) state that selection of project team relates to 'management attributes' category.

Project management aspect according to Chan et al. (2004) combines planning and control, organizational structure, overall managerial actions, implementation of effective quality assurance and safety programs. Chan and Kumaraswamy (2002) also categorize similar factors in one group accentuating communication and human resources management. Yu et al. (2006) add under the similar category control of processes naming this group as 'process-related factors'. Also as managerial factors they mention decision-making abilities and communication.

'Project participants' group seems to be the broadest one since it combines different aspects of project key players and stakeholder's management. One decade before human factor already received a huge attention from researchers. Several categories, as client, contractor, project champion and others were discussed and findings of those studies initiated a new cluster related to project participants. Thus, Chan et al. (2004) in his classification define client and project team leader dimensions for specific characteristics to be assigned accordingly. Particularly, they focus attention on client's experience, nature and size, client's expectations in terms of project costs, quality and duration and client's managerial abilities. Project team leader category attracts authors' attention in sense of managerial skills (planning, organization, motivation and control), leaders' commitments and support to project. Moreover, Müller and Turner (2008) specify leadership style of Project Manager from all other competences correlated to overall project success.

Chan and Kumaraswamy (2002) also identified project manager's capabilities and client's attributes as the most relevant success factors. Furthermore, Yu et al. (2006) distinguish between success factors related to client and those refer to end user. Other project participants in their study are united in a group of 'stakeholder management'. In contrast, Fortune and White (2006) following Formal System Model components point user and client involvement, competence of project manager, qualified team and good performance of suppliers and contractors as success factors but allocate them into different model's aspects. They also specify project sponsor/ champion role separately.

Environmental factors are referred again as it was in 90s. Chan et al. (2004) single out economic, social, political, physical, technological factors as well as industrial relations in this category. Surprisingly, Chan and Kumaraswamy (2002) point identical set of project success factors related to external environment. Moreover, Fortune and White (2006) find learning from past experience and organizational adaptation/ culture as success factors belonging to environment. Although these factors seem to benefit more to overall management like procedures, politics and personnel skills which become more efficient from project to project, it is also possible that authors' focus lies in internal environment analysis. In spite of growing interest to environmental success factors in projects some authors still do not consider this aspect as important one (Yu et al., 2006).

However generally referring back to study of Chan et al. (2004) it would be interesting that Acharva and Lee (2005) raise a discussion on that study. They stress that although Chan et al. indicate comprehensive groups of factors, most of them seem referring to human-factor. Furthermore, authors add more support to contractors' flexibility abruptly pointing it as a crucial factor without

which project success seems unachievable and comparing to which other factors might be evaluated as supportive.

As was mentioned above in 1990s a team orientated approach in stakeholders' management was not widely recognized. However, new decade develops that gap and collaboration among key project participants becomes a new focus in project management. Continuing to draw an analogy between project key players and a team, discussing joined efforts invested in project, it seems to be close to project partnering. Project partnering, according to Chen and Chen (2007), '... involves the major project participants in an alliance that creates a cohesive atmosphere enabling project team members to openly interact and perform'. In their study Chen and Chen (2007) investigate critical success factors for construction partnering in Taiwan. Basing on 19 critical success factors excerpted from studies on success factors in construction partnering and using factor analysis technique authors deliver four main clusters: collaborative team culture (which implies flexible, committed to support, dedicated team developing two-ways communications); long-term quality perspective (demands commitment to quality as well as to continuous improvements and questioning attitude from team); consistent of objectives (assumes that team promotes mutual trust, clear understanding, effective communication and expertise); and resource sharing (includes financial security, availability of resources and senior management commitments).

In spite of numerous similarities discovered among study's findings there are also some contradictions. However, discrepant character of some success factors sets striking eye on the beginning turn into supplemental to each other after complex analysis. In other words, various conclusions of different authors do not contradict each other; most of them amplify knowledge with diverse perspectives. For instance, Yu et al. (2006) declare 37 success factors, most of which do not refer to project generally but they are specified particularly for construction project briefing. Therefore, this study investigates specific area of success factor application and contributes to the body of knowledge with a more precise analysis. Moreover, Fortune and White (2006) address to slightly different list of factors due to specific approach they used. Westerveld (2003) also defines project success factors from the Project Excellence Model point of view. Both these studies expand existing knowledge by illustrating other perspectives. In addition, study of Chen and Chen (2007) express interest to success factors regarding project partnership. Although it highlight another factors mostly related to strategic aspect, i.e. long-term perspective, commitment to continuous improvement, good cultural fit, questioning attitudes and others, this research seems to be complementing to previous findings in this area.

However, besides similar and supplemental sets of levers there are some unique success factors mentioned by different authors. For instance, Toor and Ogunlana (2008) point ‘sufficient resources’ as an extra factor increasing chances for project successful implementation. Yu et al. (2006) indicate flexibility and change management as a critical aspect affecting project results directly. In contrast, Chan and Kumaraswamy (2002) define that there is a specific collection of success factors which has a potential influence on project outcome but they do not clarify which factors might be assigned to this category. Although each particular factor should be recognized as valuable and should be addressed with an attention, it seems obvious that success factors mentioned in different studies deserve more confidence.

During around half of a century period of time main thought evolved a lot: starting from basic theoretical guidance in 1970s to more specific applications in 2000s. A cumulative result of literature review is presented in a (Table, 1) It seems likely that a combination of findings from previous researches organized in chronologic order makes an appropriate base for studying construction projects success factors in developing countries.

Success factors	1960s	1970s	1980s	1990s	2000s
<b>Project</b>	----	----	-----	Scope (Walker, 1995); type, complexity, size (Akinsola et al., 1997; Songer and Molenaar, 1997; Belout 1998); size, pioneering status (Chua et al., 1999); size, project life cycle (Belassi and Tukel, 1996)	type, scope (Chan et al., 2004); clear objectives (Fortune and White, 2006); scope (Cooke-Davies, 2002); clear objectives, realistic budgeting (Yu et al, 2006)
<b>Project Management</b>	planning, feedback (Avots,1969)	Planning, scheduling, communication (Cleland and King, 1983); cost estimation, budgeting, financial support, logistic requirements (Baker et al., 1983); unrealistic objectives, communication (Hughes, 1986); communication (Locke, 1984);communication (Morris and Hough, 1987), communication (Pinto and Slevin, 1989)	Scope (Walker, 1995); type, complexity, size (Akinsola et al., 1997; Songer and Molenaar, 1997; Belout 1998); size, pioneering status (Chua et al.,1999); size, project life cycle (Belassi and Tukel,1996)	feedback, communication, decision making effectiveness (Belout, 1998; Walker and Vines, 2000); planning, monitoring, control (Jaselkis and Ashley, 1991;Belassi and Tukel, 1996)	planning, control, managerial actions (Chan, 2004); communication, plan, control (Chan and Kumaraswamy, 2002); control, decision making, Communication (Yu et al., 2006)
<b>General management and</b>	top management support, change	top management support (Cleland and King, 1983); general management efficiency, organizationa	feedback, communication, decision making effectiveness (Belout, 1998; Walker	organizational structure, safety and quality assurance programs (Walker and	Flexible management, change management (Yu et al., 2006); Organizational structure (Chan et al.,2004; Chan and Kumaraswamy, 2002)

	management (Avots,1969)	aspect (Nahapiet and Nahapiet, 1985); top management support (Pinto and Slevin, 1989)	and Vines, 2000); planning, monitoring, control (Jaselkis and Ashley, 1991; Belassi and Tukul, 1996)	Vines, 2000); top management support, organizational structure (Belassi and Tukul, 1996)	
<b>Procurement</b>	----	Resource allocation (Martin, 1976)	----	procurement and tendering processes (Pocock et al., 1997; Kumaraswamy and Chan, 1999; Walker and Vines, 2000; Dissanayaka and Kumaraswamy, 1999)	(Chan et al., 2004; Chan and Kumaraswamy, 2002; Fortune and White, 2006; CEEC and KPMG, 2008)
<b>Environment</b>	----	----	-----	social, political, technical (Akinsola et al., 1997; Kaming et al., 1997) location and limitations (Chua et al., 1999); economic, political, social, technical (Belassi and Tukul, 1996)	economic, political, physical, social, technical, industry relations (Chan et al., 2004; Chan and Kumaraswamy, 2002) learning from past experience, organisational culture (Fortune and White, 2006)
<b>People</b>		PM competence (Sayleas and Chandler 1971)	Client characteristics, personnel capabilities (Cleland and King, 1983); PM competence, project team qualification (Baker et al. 1983); PM competence and authority	PM's experience, commitment, competence, authority (Chua et al., 1999); client's power (Walker, 1995); client's type, experience, knowledge (Songer and Molenaar, 1997); client relations (Munns and Bjeirmi, 1996); client/ user	client's experience, nature, size, expectations in terms of project costs, quality, duration and team leader's planning, organization, motivation and control abilities(Chan et al., 2004); PM capabilities and client's attributes (Chan and Kumaraswamy, 2002); client, user,

			(Locke, 1984); client relations, qualified project team (Morris and Hough, 1987); PM competence, personnel power (Pinto and Slevin, 1989)	involvement (Turner, 1999; Wateridge, 1995); competences and skills of key players (Belassi and Tukel, 1996); PM's competence and authority, client's personnel and top management support, contractor team competence and level of service (Chua et al., 1999); contractor's experience and finance stability (Dissanayaka and Kumaraswamy, 1999); influence of project champion (Cash and Fox, 1992; Martin, 1994; Jang and Lee, 1998); team spirit and collaboration (Hassan, 1995; Larson, 1995; Chua et al.1999)	stakeholder management (Yu et al., 2006); user/ client involvement, PM competence, qualified project team, relations with sponsor/ champion (Fortune and White, 2006); PM's leadership style (Müller and Turner, 2008) contractor's flexibility (Achrva and Lee, 2005); team spirit and partnership between key project players (Chen and Chen, 2007)
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*Table 1 Aggregated findings on success factors studying*

## **2.5. Criticisms of Success Factors**

Evolutionary development of views on success factors has expedited innovative ideas, outstanding research analysis and practical observations. However, at the same time it introduced new debates, comments and gaps and forced researchers to revert to basic notional fundamentals. Except Cooke-Davies's (2002) distinctions discussed in conceptual part of this paper, Belassi and Tukel (1996) provide a strong belief in necessity to differentiate success factors and success criteria from one side and success factors which are under control of project manager and which are outside of it from another. The majority of studies aim to finalize a set of success factors in order to make project participants aware of highly significant areas in terms of project success. Thus, some environmental factors discussed above like political or economic are not under project manager's control but still can affect project results. Therefore, a purpose of distinguishing success factors regarding project manager's control seems to be unclear.

Fortune and White (2006) separate success factors inter-relations as an unstudied area and point that both connections and interferences between success factors are as important as individual factors. They provide an example how external factors can change internal management and therefore adversely affect final project results. Belassi and Tukel (1996) analyse factors inter-relations from another point of view. They emphasize a possible synergetic effect of factors; different combination of factors applied on different stages of project life cycle can lead either to success or to failure. An existence of these cross connections among project forces seems obvious and therefore will be examined in present study focusing on interference between project successes factors in Addis Ababa construction industry.

Moreover, there are number of researchers (especially during the last decade) promoting an idea to group success factors and then investigate a value of each particular group (Belassi and Tukel, 1996; Chan et al. (2004) and others). However, Toor and Ogunlana (2008) point that due to existing inter-relations among factors some of them might fall down in a different section while authors group them. They stress a high probability of being deluded by analyzing factors independently during a classification process. The idea of grouping factors will be applied in current research as well as an investigation on each separate factor to minimize possible risks described above.

According to Larsen and Myers (1999) another gap in studies about success factors could be found. Authors state that usually factor approach is perceived as a static and orientate on a set of

success drivers instead of providing its dynamic application. In other words factors might change their value, priority or importance pending a project. In addition, Fortune's and White's (2006) Formal System Model developed in their research seems dynamic and is initially directed against this gap; it is likely allow to consider those relationships between factors during project implementation.

Pinto and Slevin (1989) emphasized that studies about critical success factors will be relevant until an idea how to measure success will not be produced. One year before Pinto and Prescott (1988) investigate that importance of success factors varies depending on a stage of project life cycle and furthermore, it also fluctuates against the measure of success used. It is likely that a problem of understanding what really project success is and where a border between success and failure runs, is in minds of project key players. Belassi and Tukel (1996) accentuate this problem providing clear examples when project managers have to pay penalties due to project delay, which sounds negatively for project manager, however from the client prospective the project tends to be considered as a successful one. In this case one project outcome could be interpreted differently regarding a party's point of view. Cox et al. (2003) also claims that success factors may vary according to the stakeholders' perception of project success. Nevertheless, this criticism seems unavoidable taking into account the scope of current research and therefore only simplified evaluation of project success will be considered.

## **2.6. Project Success Factors from Practitioners' Perspective**

Apart of theoretical approach which is mostly reflected in numerous publications there is also practical point of view.

One of the most referred sources of best practice is Project Management Body of Knowledge Guide (PMBoK). PMBoK is a Project Management Institute's (PMI's) publication which represents a collection of knowledge areas considered as a best practice in project management field. It is internationally recognized (IEEE Std) standard for fundamentals in this area regardless project type; accumulated knowledge might relate to construction, aerospace, IT and other projects. Originally PMBoK includes several project processes, phases, knowledge areas and provides detailed explanation of them however, it seems more comprehensive to illustrate PMBoK's contribution through a comparison with another practical point of view on project success factors (PMBok Guide, 2004).

Another practical approach was formulated by Iree Tec Incorporated which was founded by a project manager and aims to improve project managers' skills through analysis of best practices. **miApproach** is a core philosophy of Iree Tec. It has been formed on personal experience and adopted with number of industry's examples which makes it empirical by nature. This approach is focused on the following factors: strategy (where are you going?), people (people have to be on right levels and in right teams), and processes (what to do? when?), boundaries (what are the priorities?) and tools (what kind of tools and procedures are needed?) (Iree Tec, 2003).

Generally PMBoK (PMBoK Guide, 2004) and miApproach (Iree Tec, 2003) views do not carry conflicting information; they are not opposite to each other. Both of these approaches rather follow different structure. PMBoK being a repository of best practices divides knowledge in areas, then processes following by tasks. For each process a number of inputs, tools and techniques and outputs are defined. Also project success factors are not formulated; instead they might be extracted from general information as an areas of high importance and therefore have subjective evaluation. Comparatively, **miApproach** includes different phases of project processes and focuses attention on success factors in each of them. The set of groups of success factors remain the same for each phase: strategy (alignment of project with business and technology strategies), people (tasks and people are matching on the basis of skills), processes (processes are the basis for tasks and tools), boundaries (schedule and budget are adhered to project plan, resource are allocated properly and risks are identified and managed) and tools (standards, procedures and software are defined accordingly to work which has to be completed). In addition, PMBoK enable managers to plan and implement project however miApproach accentuates a necessity to make a step backward and have a holistic view defining what is important and what is needed. In this sense both approaches are supplementary and provide better understanding of entire project management process.

Moreover, these approaches do not exhaust all the view. Thus, 'Projects in Controlled Environments' (PRINCE2, 2008) is a process based method for effective project management. It is a guidance of best practice which is used by UK Government and is widely recognized in private sector. This approach apart common referred factors indicates alignment of project and company vision, established possible impact of changes and motivation system (PRINCE2 Guide, 2008).

Additional information might be found from The Standish Group which is a market research and consulting firm specializes on IT projects and providing advisory service in a field of project management. It is investigating IT projects since early 1994 and has been leading provider of project management annual reports called CHAOS. As the most important aspect of research lies in identification of reasons why projects fail, it is obvious that it ends up in a success factors set. Thus, in research published in 1994 (CHAOS Report, 1994) following success factors were specified as three top ranked: user involvement, management support and clear statement of requirements. Although, these factors were listed before by several researchers this study contributes with such unique factors as ownership (alignment of responsibility and authority) and clear vision. Another CHAOS Report was reflected in Report on Project Failure and Success Factors (2006) made for Australian Computer Society. Referred CHAOS Report was developed in 1999 and interestingly not much varied from previous one completed in 1994. Later study also includes effective risk management as a factor influencing project delivery.

Summarizing practitioners' views it seems likely that most of them mention vision as a project success factor from different perspectives. miApproach stress a connection between project and business strategy, PRINCE2 points an alignment of project objectives and company vision, The Standish Group also considers clear vision as a driver leads project to success. Furthermore, people factor is also one that is presented by all mentioned practitioners: miApproach promoting match between people, skills and tasks; PRINCE2 claims that motivation system is significant on the way to success; The Standish Group presents an importance of ownership in projects. Also, risk management is pointed by PRINCE2 (measured possible impact of changes) and The Standish Group. Apart of the fact that some factors are not overlapping and are listed by one of the source only, they should be taken into consideration as well.

**In my Opinion,** besides some opposite opinions for this study it was decided to take into attention all project success factors found in publications regardless the project type they were extracted from. Therefore, levers lead to a successful execution of IT project would be endowed the same value as construction projects, for instance. The reason of this generalization relates to a fact that projects are not performed in vacuum and are surrounded by common environment, procedures, policies, tools. These similar and/ or common factors could be accumulated and used in the current study.

Briefly, evolution of thought in area of success levers in projects starts in 1960s when main attention of studies lies in planning and control area. Also top management support as well as

change management are considered. Later when planning school of thought (Mintzberg, 1998) dominates in management, the role of planning, scheduling, feedback system and control also become stronger in project management area. Moreover management support, resource allocation and PM's competence are indicated as significant. Next decade brought communication, organizational aspects, realistic and clear objectives; client's and project team's characteristics were added to body of knowledge. In 1990s studies concluded that project related factors have a great impact on project success. Project scope, type and size contributed to existing findings. In spite of numerous of reiterations of factor this decade also broad human factor including user, contractor and project champion role; procurement and environmental factors. During 2000s authors has been concentrated mostly on categorization of factors rather than on production of new factors themselves.

Moreover, practitioners' perspective was analysed as well. Practice supplements theory mostly in vision, human and risk management aspects.

(Figure, 6) reflects success factors extracted from different sources and which will be a base for answering a research question for this study.

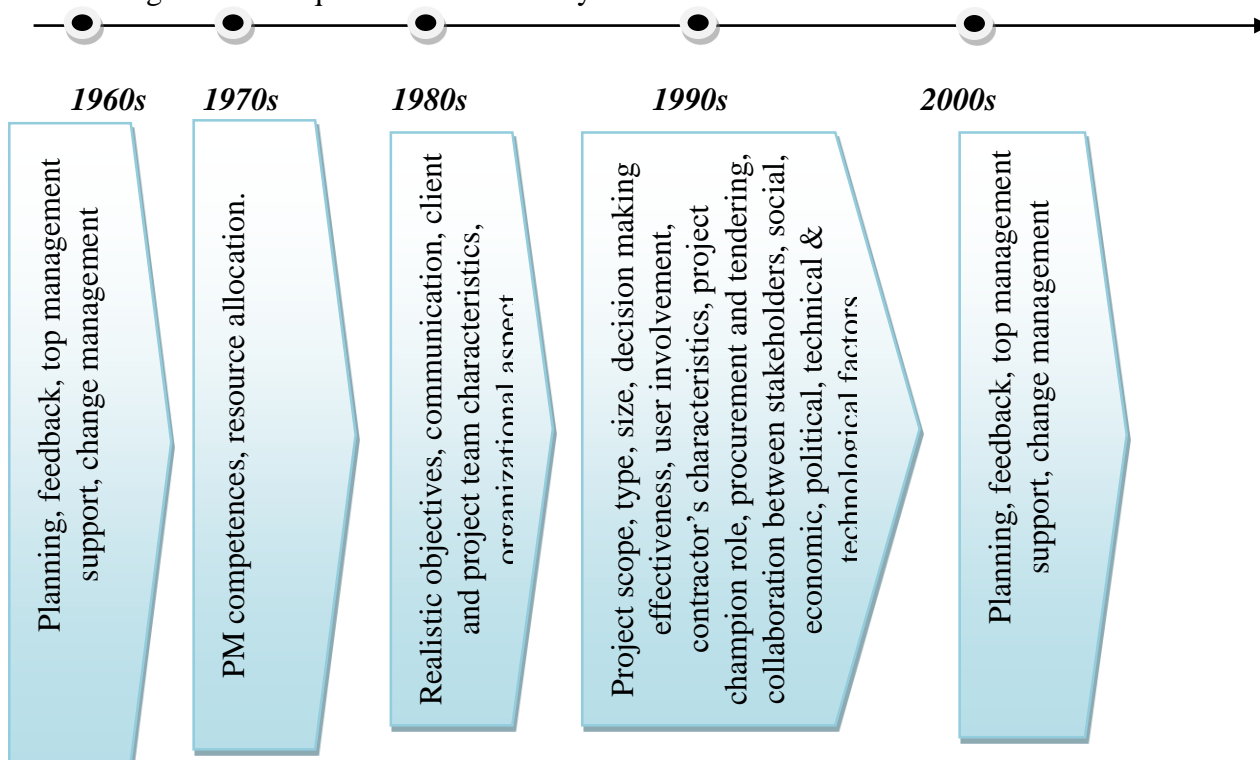
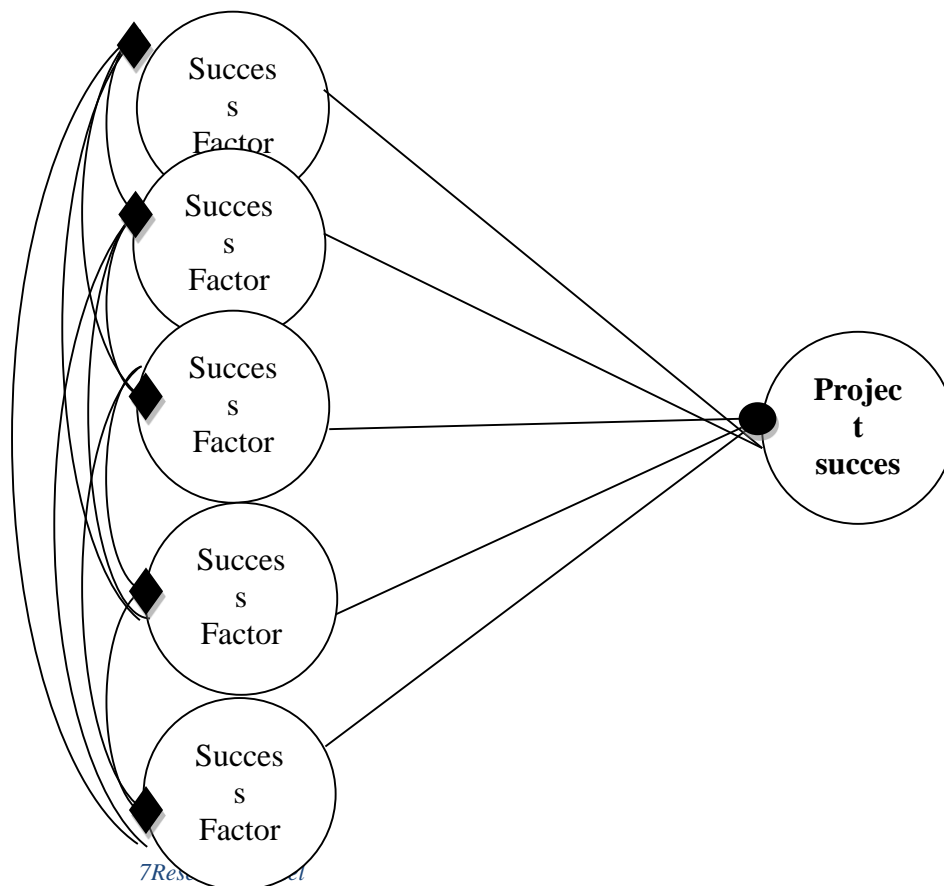


Figure 6 Project success factors time framework

These success factors are widely recognized and therefore might be considered as a platform for questionnaire design which is described deeply in the Methodology chapter.

A research model (Figure, 7) for the present research is seen as the following: success factors indicated in Literature Review (Table, 1) are considered as independent variables and presented in six groups (X<sub>1</sub>, X<sub>2</sub>, X<sub>3</sub>, X<sub>4</sub>, X<sub>5</sub>, X<sub>6</sub>) as they always ‘surround’ project (people, environment etc.) and lead it to success; whereas project success presents dependent (Y) variable which always changes according to the power of independent variables. The coding of the research model with description of groups of success factors as well as single factors is presented in Appendix 1.



Figure

7Research Model

Key: (X<sub>ij</sub> i-group of success factor; j-individual success factor)

This research focuses on investigation of significance of selected success factors (see Appendix 1) for project success in conditions of Addis Ababa construction industry. Moreover, it also aims to illuminate possible interrelations between success factors to study factor’ importance in depth and to avoid criticism related to probable ‘synergetic’ or ‘non-synergetic’ impact of factors on project success. This research model will be used to test two hypotheses and answer the research questions:

***Hypothesis 1:*** all the success factors of the research model (Appendix 1) have a significant impact on construction projects success in Addis Ababa.

***Hypothesis 2:*** all the success factors of the research model (Appendix 1) are interrelated in their impact on construction projects success in Addis Ababa.

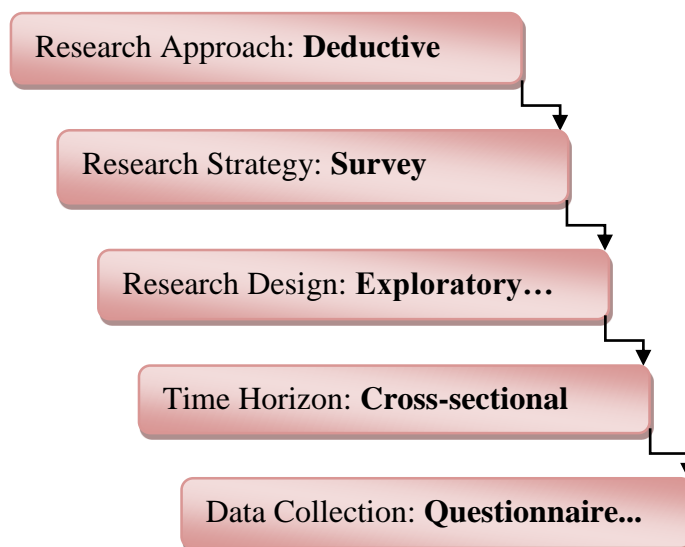
## CHAPTER THREE

### RESEARCH METHODOLOGY

According to Cooper and Schindler (2003) the next step in the research process after studying the literature, finding ‘management dilemma’ and identifying the research questions is deciding on the most suitable methodology approach. It might be considered that the research approach limit itself to the data collection methodology chosen, i.e. interview or questionnaire. However, Saunders *et. al.* (2007) argues that it is just the core of the ‘research onion’ and in order to get to this level all the other layers ‘should be peeled away’.

Therefore, the main contribution of this chapter is describing researchers’ general study approach followed by discussion and motivation of data collection method itself. In addition, the grounding of data collection tool chosen is presented as well as description of design of the instruments used in the research.

This section might be divided for convenience in two main parts. The first part deals with identification of the underlying philosophy of the study. It is based on the models and frameworks adopted from Saunders *et. al.* (2007), Hair *et. al.* (2003) and Bryman and Bell (2003) and touches upon such questions like research philosophy, research approach, research strategy, design, time horizons and the data collection methods suitable for this study. Picture 3.1 provides a graphic summary of the first part.



*Figure 8 Methodology approach of the study*

*Adopted from: Saunders et. al.(2007) and Hair et. al. (2003)*

The second part elaborates on the discussion of the data collection techniques chosen for the research. A detailed description of methods design and flow of research process, limitation of the methodology and ethical considerations are summarized in this part as well.

### **3.1. Study Population**

Source of population is project team members who are participating in the housing construction projects in Addis Ababa Saving Houses Development Enterprise. Particularly the study target people who are directly involved to projects/Programs activity such as: project Managers, Project Coordinators, and other team members independent to the Enterprise's staff. All study of population is project team members of selected organizations selected based on purposive sampling approach. The current total number of construction contractors are one hundred ten. Among them hundred questioners are distributed and seventy on of them replied. The researcher not encompassed supporting staffs to its population of study.

### **3.2. Research Approach**

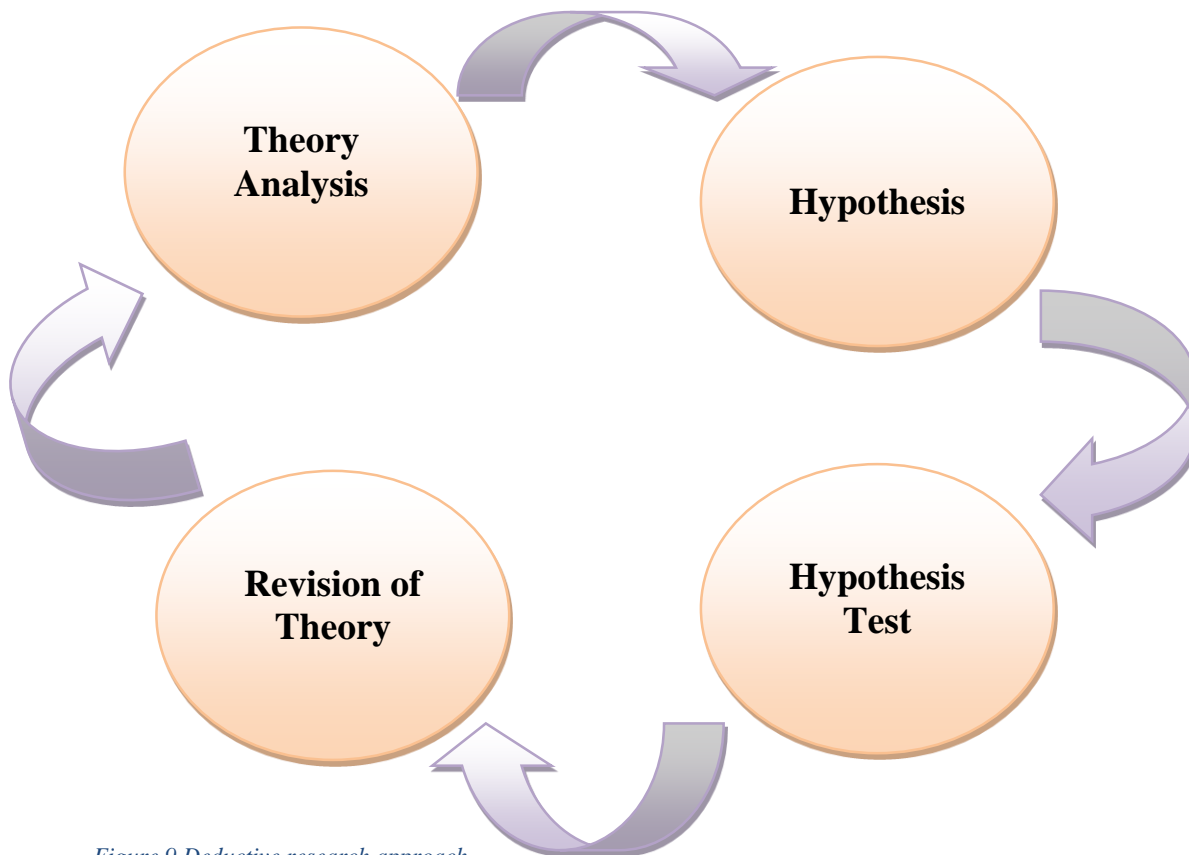
A deductive approach is concerned with “developing a hypothesis (or hypotheses) based on existing theory, and then designing a research strategy to test the hypothesis” (Wilson, J. 2010).

Deductive approach to research is seen as one of the main principles of this study seems the most appropriate for current research. Deductive approach helps the researcher to accumulate current knowledge about the area of interest, create hypothesis and by testing and analysing them develop the existing theory.

Deductive approach offers the following advantages to achieve the current study:

1. Possibility to explain causal relationships between success factor concepts and variables
2. Possibility to measure success factor concepts quantitatively
3. Possibility to generalize research findings to a certain extent of the study significance

Figure 9 illustrates the deductive approach of this study.



*Figure 9 Deductive research approach*

*Adopted from: Bryman and Bell, 2003; Saunders et. al., 2007; Ticehurst and Veal, 1999.*

The process begins with analysis of the current literature related to success factors in project management area and construction projects in particular. As a result of review of numerous articles an aggregative table of success factors studies was formed.

This aggregative table became a basis for the research model and hypothesizes:

**Hypothesis 1:** all the success factors of the research model (Appendix 1) have a significant impact on construction projects success in Addis Ababa.

**Hypothesis 2:** all the success factors of the research model (Appendix 1) are interrelated in their impact on construction projects success in Addis Ababa.

In order to test the hypothesis an appropriate research strategy and data collection technique was chosen. A precise description of characteristics of the methodology approach is provided in other parts of the section.

After an analysis of the findings the hypothesis might be accepted, rejected or partly rejected (Bryman and Bell, 2003). Taking into account the perspective of current study the analysis of hypothesis might develop the existing theory determining which success factors are the most important in housing construction projects in Addis Ababa.

### **3.3. Research Strategy**

The importance of research strategy is unlikely to be exaggerated. According to Jankowicz (1991) the research problem and its purpose are the key parameters which identify the most appropriate research methods and techniques. Therefore, considering the research area width and the purpose of identifying general tendencies in the country's economy as a whole, the choice of the methodology should be well grounded. Therefore, this section aims to provide various information regarding methodology design. According to Saunders *et. al.* (2007) research strategy determines sources of data collection, considers different constraints related to the sources like time, location or budget. In addition, it is an overall plan how research questions will be answered which involves such decision as focusing on quantitative or qualitative analysis (Bryman and Bell, 2003) or choosing the research strategy itself.

#### **3.3.1. Qualitative and Quantitative Approaches to the Research**

There are several ways to explore which success factors in housing construction projects in Addis Ababa might be considered as most important. Both qualitative and quantitative techniques might be used to conduct a research in business area (Ghauri and Gronhaug, 2002; Jankowicz, 1991; Bryman and Bell, 2003).

Some authors believe that qualitative pattern better addresses business issues (Ghauri and Gronhaug, 2002) on the other hand some of them strongly support qualitative approach (Reichardt and Cook, 1979; Ticehurst and Veal, 1999). Quantitative methods might provide a more valid data taking into account the scope of research. However qualitative methods are more flexible and could be used to exploit in depth different areas of research question. Qualitative methods are therefore more useful for a deep analysis of the situation (Ghauri and Gronhaug, 2002).

Since the research topic of this study is finding general tendencies in housing construction projects as well as exploiting some unique trends in underlying reasons a combination of quantitative and qualitative methods will be used. These two approaches might complement each

other and lead to a coherent analysis of the research area (Jankowicz, 1991). This statement is supported by Bryman and Bell (2003), moreover the authors' triangulation model which promotes the advantages of combining both techniques as well as considering different sources of data was employed in the study to increase findings validity.

Therefore, semi-structured interviews were chosen as a data collection technique to exploit the area in depth and add knowledge to the existing success factors in construction industry. Since the amount of research in this area which deals with Addis Ababa market is considerably limited this step might help to develop the aggregated table of success factors by adding success factors particular for the City's economy. Then a questionnaire will be distributed among housing construction project managers in Addis Ababa to collect data suitable for quantitative analysis. Based on the data collected the research hypothesis might be tested and analysed.

The detailed grounding of data collection technique choice will be discussed in the further sections as well as detailed process of design and data collection itself.

### **3.3.2. Type of Research Strategy**

Following the 'onion' model (Saunders *et al.*, 2007) survey was chosen as the main research strategy as it seems logical next step taking into account research philosophy and deductive approach as well as research question. A number of factors indicate that survey is an appropriate strategy to answer the research question:

- Survey allow to collect a large amount of data about population in an economical way (both in terms of money and time);
- Survey provide with standardized answers allow easy comparison and generalization;
- Validity of surveys is 'perceived as authoritative';
- Survey increase the researcher's control on the process;
- Survey gives researchers opportunity to save on design and increase the speed of data collection.

Therefore, taking into account the purpose of the research, the research question as well as constraints in terms of budget and time, survey might be a suitable strategy for this study.

### **3.4. Research Design**

As research design mainly deals with research purpose issues its choice is mainly grounded on the aims of current study discussed in the introduction section. A number of designs were described in the literature however researchers generally choose among three of them:

1. Exploratory studies are particularly used when the research area is not well established, when researcher need to ‘clarify the understanding of the problem’.
2. Descriptive studies require a clear picture of the research interest area in order to be able to develop hypotheses and test them.
3. Explanatory studies deal with causal relationship between the variables. The main question considered here are patterns in data collected.

*(Adopted from Saunders et al. (2007), Hair et al. (2003) and Ticehurst and Veal (1999))*

However as well as any researcher can use different strategies in his/her research, different research designs may be employed. Moreover, it is very unlikely that by choosing just one of the designs described above researcher can contribute significantly to theory development (Saunders *et al.*, 2007).

Therefore, this research employs all three designs in order to conduct a proper research. Descriptive design will be used in order to test the hypothesis of importance of the success factors for housing construction projects in e identified both by the aggregated literature review table and interviews with managers. It is complemented then by exploratory approach which by analysing the importance of success factors from different perspectives will try to understand the drivers of the ranking. Explanatory design will be also involved since one of the aims of this research is finding relationships between different factors in their influence on project success.

### **3.5 Time Horizon**

In terms of time horizon there are two main types of studies described in the literature: cross sectional and longitudinal (Saunders *et al.*, 2007, Hair *et al.*, 2003, Bryman and Bell, 2003). Cross-sectional study provides a snapshot, ‘a description of elements at a given point of time’ (Hair *et al.*, 2003). On the contrary longitudinal study focuses on change and development of the parameters during a certain period of time (Saunders *et al.*, 2007).

Since survey was chosen as a research strategy cross-sectional time horizon seems to be an appropriate one (Hair *et al.*, 2003). This statement is also supported by the limited time frame to carry out research project which is as argued by Saunders *et al.*, (2007) the main driver of time

horizon choice. In addition, the research question itself does not require longitudinal approach since the ranking of success factors at a single point of time will provide enough data for qualitative analysis.

### **3.6 Data Collection Techniques**

The choice of data collection technique is a final step in the methodology design process (Saunders *et al.*, 2007). In order to collect data about construction industry in Addis Ababa a questionnaire sent to project managers of the construction companies might be a good approach. As a preparation stage of the questionnaire a semi-structures interviews or a case study can be conducted in some of the companies to study the area in depth before conducting quantitative survey.

#### **3.6.1. Semi-Structured Interviews**

Case studies or semi structured interviews might be conducted to explore the area in depth regarding peculiarities of the country. Additional success factors might be identified which are specific for Addis Ababa housing construction industry and were not covered in the literature review.

Case-study methodology, though, has a number of disadvantages regarding this particular research. Ghauri and Gronhaug (2002) argue that it was mentioned by Eisenhardt (1989) that case study is suitable only for new research areas where ‘existing theory seems inadequate’. In addition, since the focus of this research is Addis Ababa housing construction industry as a whole concentration on ‘one specific case’ (Bryman and Bell, 2003) might not help to drive to relevant conclusions. Therefore, semi-structured interviews are likely to be more adequate methodology in this case.

As the main reason of using semi-structured interviews in this research is clarification of general trends in the industry this approach is likely to be a good one (Bryman and Bell, 2003). Being a flexibly methodology semi structured interview “provide insights into unexplored dimensions of a topic” and helps to focus more on interviewees’ attitude to the research topic rather than on a strict list of questions (Black and Champion, 1976).

According to Collis and Hussey (2003) it was claimed by Easterby-Smith, Thorpe and Lowe (1991) that semi-structured interview is an appropriate method when:

1. It is essential to explore interviewee's opinions and beliefs about particular areas of research topics. As the main research question is identification of success factors the managers' point of views are important. They manage construction projects from day to day and may address some issues that were not covered by the literature review.
2. Some 'specific aspects' of the process are not clear. There is no previous study of the success factors in Addis Ababa housing construction industry. The existing literature was used to determine the framework for the questionnaire. However semi-structured interviews are used to explore the topic from the Addis Ababa experience perspective.
3. The research deals with confidential or commercially sensitive information. As success factors management techniques might be associated with know-how of the companies semi-structured interviews are used to solve the ethical issue. The information rated as sensitive by the interviewees was not included in the report. Additional questions were asked in order to obtain general information about specific areas.

### **3.6.1.1 Interview Questions Design**

According to Bryman and Bell (2003) a special process can be employed to formulate questions for an interview in social science research. Since a semi-structured interview approach was chosen a list of questions covering specific topics was mainly used as a guide (Appendix 2). The role of semi-structure interviews in this research might be limited by two objectives. First of all, it aims to identify important success factors particular for Addis Ababa industry and not covered in secondary sources. Secondly, interviewees will play a role of focus group for questionnaire pilot testing. This will be done to make final correction to question formulation and survey layout. Interviewee's opinion and understanding of the subject was of crucial importance. Therefore, the main aim of interviewers was rather on exploring area in depth than focusing on asking a strict list of question.

Nevertheless, the list of questions was used to cover all the essential topics. Based on literature review several groups of success factors were identified in construction industry. Asking respondents point of view regarding this groups was the core of the interviews design. In addition, interview design included information regarding participants as well as their understanding of project success category. This part of interview process will be able to add knowledge in the area of Addis Ababa peculiarity of construction projects which is unlikely to be obtained from general sources.

Since the second aim of the interviews is testing the questionnaire understanding, interviewees were asked to comment on questionnaire design. This section of interview was placed after the first one to avoid bias responses. Only after managers identify success factors which they think influence housing construction projects in Addis Ababa a list derived from literature will be shown to them.

In the beginning of the interview general questions might be asked to establish a contact with the interviewee and start the process smoothly. After the introduction and general section more specific questions might be asked regarding the groups of factors and their impact on respondent's project success. The questions will be formulated as open-ended ones to understand peculiarities of Addis Ababa construction industry and avoid biased answers.

However, the general flow of the question may vary depending on the circumstances and the conversation flow. Interviewer will aim to ask questions regarding all group of factors mentioned in the literature review. However, if she/he considers exploiting one of the groups more in depth additional questions might be asked to clarify the interviewees' answers. Since the primary goal of conducting semi-structured interviews is finding new success factors which were not mentioned in the literature this direction of the interview process will be of high priority.

At the end of the interview the questionnaire was sent to every participant. Interviewees were asked to complete them and provide any types of comment regarding the layout or content of questionnaire. This part of the interview design aims to eliminate a number of difficulties like terminology interpretation, formulation of questions in a foreign language and general understanding of questionnaire as such.

The interview question guide is presented in Appendix 2.

### **3.6.1.2 Interview Procedure**

All the conclusions are made directly from the answers of interviewees or interpretation of their discussions. Interviewers' personal considerations were not taken into account to avoid biased judgments. A copy of interview summary was sent to every participant to assure the validity of findings with a follow up letter.

A summary of interviews findings is presented in Appendix 3. The design and layout of the questionnaire was evaluated as 'clear and consecutive' by one of the interviewee however some success factors were interpreted in a slightly different way. Appropriate were made to the questionnaire.

### **3.6.2. Self-Completion Questionnaire**

To collect appropriate data and answer the research question a self-completion questionnaire methodology has been selected. Questionnaire's aim according to Gilham (2000) is 'to get information from people by asking questions'. Self-completion questionnaire refers to filling in inquirer by respondents. This method was chosen as many authors consider questionnaire as useful when the research question need 'structured data and when data are required from samples representatives of defined wider population' (Ticehurst and Veal, 1999, Bryman and Bell, 2003, Saunders, *et al.*, 2007)

Saunders, *et al.* (2007) argues that questionnaire is one of the 'most widely used survey data collection technique'. As the set of questions remain the same it becomes an efficient tool of data provision for quantitative analysis if a large sample is involved in the survey. According to Bryman and Bell (2003; 141) 'in many ways, the self-completion questionnaire and the structured interview are very similar methods'. However, questionnaire is not influenced by interviewers' biases; is free from interviewer effects like influence of gender, ethnicity, social background (Bryman and Bell, 2003; Ticehurst and Veal, 1999); it is more convenient for respondents and excludes any type of pressure on them (Saunders, *et al.*, 2007). Also, comparing with semi-structured interview questionnaire provides respondents' anonymity and allows asking more people in a short period of time.

#### **3.6.2.1 Sample Accuracy**

Another important area of the data collection technique section which might require further substantiation is the characteristics of project manager's sample which was chosen to represent the housing construction industry of Addis Ababa. The efficiency of studying a sample instead of the whole population is supported by numerous researchers (Cooper and Schindler, 2003; Bryman and Bell, 2003; Ghauri and Gronhaug, 2002; Collis and Hussey, 2003; Saunders, *et al.*, 2007; Ticehurst and Veal, 1999; Sekaran, 2003). However, the same authors stress that the sample becomes an efficient tool only when accuracy and precision criteria are met. According to Cooper and Schindler (2003) accurate sample should not have any biases and therefore cannot lead to a 'systematic variance' in the research. In addition, sample should be precise enough in order to represent population characteristics as close as possible.

The extreme importance of these issues was taking into consideration when the sample for this study was chosen. Accuracy of the sample was addressed following the framework developed

by Sekaran (2003). The sample was selected without any systematic biases. Different locations, different type of companies regarding size, number of completed projects, experience and different companies' databases were reviewed. This approach might also ensure the high level of precision of the sample. Simple random sampling technique which seems the most appropriate one regarding the purpose of the research was used to draw the sample (Cooper and Schindler, 2003; Bryman and Bell, 2003; Saunders, *et al.*, 2007; Sekaran, 2003).

### **3.6.2.2 Sample Precision**

Since the focus of the research is on Addis Ababa construction industry as a whole the representativeness of the sample gains significant importance. The precision of the sample is increased by focusing directly on project managers who are involved in the day to day operation with different housing construction projects. As main stakeholders they have the most precise picture regarding contribution of each factor to overall project success. The fact that the targeted respondents were drawn for this study without any biases like age, sex, or number of completed projects also seems to contribute to increase of the precision level (Cooper and Schindler, 2003).

In order to achieve sample precision and ensure that the respondents will have the relevant level of knowledge to answer the questions several sample refinery techniques were purposely or accidentally applied to the sample.

Secondly industry sample refinery was introduced. This was done on purpose according to the research question. Since this study focuses on housing construction projects companies which operates in civil engineering construction or industrial construction were excluded from the list of respondents. By doing so the researches aim to increase the quality of the sample by targeting the companies mainly involved in housing construction. In case information provided in the database was incorrect one of the questions in the questionnaire was design to check this information.

It is likely that the refinery of sample will significantly increase the quality of responses obtained. Combined with an appropriate questionnaire design it might form a relevant basis for further analysis.

### 3.6.2.3 Sample Size

Additional important characteristic of the sample which is argued by many researchers as the most important one in terms of precision is suitable sample size (Cooper and Schindler, 2003; Bryman and Bell, 2003; Saunders, *et al.*, 2007; Ticehurst and Veal, 1999; Sekaran, 2003). However, the majority of the research in this area focuses on using samples in order to identify some absolute characteristics of the population like age, income or number of children. In this case the standard error which mainly depends on standard deviation of the sample and sample size might have a significant impact on the precision of the study. Statisticians did numerous research in this area and developed precise formulas and tables researches might use if they know the population size and the level of error (Cooper and Schindler, 2003; Saunders, *et al.*, 2007; Ticehurst and Veal, 1999; Sekaran, 2003).

However, since the focus of this research is on Addis Ababa housing construction industry the population size is very unlikely to be known as no records of industry employees exist in the city. Moreover, it is very difficult to identify the borders of the industry either. Another peculiarity of this study is focus on relative data rather than absolute. The main question in the questionnaire is a Likert scale which represents the importance of each success factors. Therefore, the final sample distribution gains particular importance. Only if it is normally distributed the conclusion about the importance of every factor might be generalized to industry level.

A lot of research was conducted by statisticians to identify which sample size should be considered large enough regardless of the size and distribution of the population.

According to Berenson *et al.* (2002) we can refer to the central limit theorem which states that for ‘many population distribution, when the sample size is at least 30, the sample distribution will be approximately normal’. Therefore, taking into account that the assumptions for the theorem (Berenson *et al.*, 2002) were considered and the response rate, as identified above, is unlikely to exceed 30 per cent the questionnaire will be sent to minimum 100 housing construction project managers in Addis Ababa.

### **3.6.2.4 Questionnaire Design**

According to Collis and Hussey (2003) questionnaire is performed as a list of question which were well structured and tested before. Therefore, the issue of questions' design was addressed in the following way. First of all, recommendations developed in the existing literature regarding the main areas of questionnaire design like length, types of questions or scale used were strictly followed (Bryman and Bell, 2003; Ghauri and Gronhaug, 2002; Collis and Hussey, 2003; Saunders, *et al.*, 2007; Ticehurst and Veal, 1999; Sekaran, 2003; Fowler, 1995). Secondly, a pilot questionnaire was sent to a small group of people (three persons) before it was spread among informants to obtain a higher quality of question formulation.

In addition to written above, success factors in the housing projects are mostly well known by the managers who are responsible for entire project success. Therefore, selection of questionnaire based on literature background as research methodology seems to be appropriate. It allows respondents to spend as much time as (s)he wants, to concentrate and describe his/her own set of factors in the best way. It is important as some managers do not analyze this area precisely and therefore they might require more time in order to think and identify the most critical factors for their project success.

The design of the data collection technique was based on the combination of literature analysis and qualitative research carried out before the questionnaire (Appendix 4). In order to answer the research questions this questionnaire has two sections which will address several important areas.

Regarding the respondents and company's background: This section of questionnaire will briefly provide key information about position of respondent, company's size and scope of operations as well as main clients and projects types. This part is mainly needed to support the relevance of current research findings and find possible existing trends between company characteristics and importance of different success factors. Some valuable inputs were made by pilot questionnaire group during the semi-structured interviews. For example, the company size question was evaluated on a different scale. Since as mentioned by one of the managers 'the majority of construction companies have 200 to 2000 employees' the scale had a narrower interval within this limits.

Two questions using the Likert scale summaries successfulness of the respondent's last project from different sides like delivering on time or profitability. These questions will serve as a

starting point on analysis since correlation between different type of project success and different group of factors might be present.

In the same section the concept of ‘your last project’ is introduced. By doing so researchers plan to ask respondents not about project in general in their company but about specific last project they were involved. This might help to avoid receiving responses that all the mentioned project characteristics/success factors are important which will make further data analysis possible. Asking the respondents about projects in general might lead to a situation when the spread of responses is so narrow that relevant conclusions cannot be made regarding dominance of one factor on others.

This section starts from two optional open questions which focus on the concept of success followed by detailed evaluation of impact every factor on project success. Regarding short period of time for research and a necessity to figure out the importance of every factor of the research model (Appendix 1) the Likert ranking scale (5 – very important, 4 –important, 3 – neutral, 2 – unimportant and 1 – not important) question was selected as the main one. According to Hague (1993), Gillham (2000) and Sekaran, (2003) this type of questions is the most effective in studying respondents’ ‘degree of importance or the priorities... to set of objects’. Likert scale might also contribute into research by giving a possibility to analyze relationships between different success factors. Data achieved by ranking the factors from 1 till 5 might be used for further correlation analysis and help to answer one of the research question regarding interrelationships between different factors.

Information derived from semi-structured interviews was added to the groups of factors from the literature review. However, the aspects mentioned by the project managers were mainly covered by existing framework. Therefore, neither additional groups nor single factors were added to the survey. However, an open question was still placed at the end of the table asking respondent’s opinion about factors not mentioned in the research.

The concept of ‘your last project’ was used in this set of questions as well. By focusing on one single example rather than all the projects the respondent was involved, researchers hope to achieve wider spread in ranking of importance of the factors.

The next question in the section was design to support the previous section by asking directly the importance of group of factors for achieving success. By assigning percentage to every group

respondent will provide information regarding contribution of different groups to successful execution of projects.

### **3.6.2.5 Questionnaire Analysis**

First of all, the questionnaires will be examined on accuracy and relevancy in order to filter the forms which cannot be used for further analysis. The forms left after the filtering will form the database for further analysis.

The data analysis and interpretation in this study is conducted by using statistical tools. The responses gathered from research question coded and entered in to SPSS version 21 software.

Based on this data the description of the sample will be conducted. Distributions of different sample characteristics like number of years of experience or area of respondents' company's operation will be presented. It will provide a general overview of the sample as well as give some perspectives on data relevance and research validity.

After the sample description the first hypothesis will be tested. Firstly, significance of groups of success factors will be examined from perspective of project/ project management success and experience of the respondents. Based on this analysis groups of success factors will be divided on two areas: primary and supporting success areas.

The further analysis of single factors will be performed only in the primary success area and ranking of these factors will be performed. The most significant factors of the primary success area will be presented separately.

Then the second research hypothesis will be tested. The responses to the Likert scale ranking question from the questionnaire will be collected in an array of data. Correlation analysis will be performed in MS Excel which will provide the researchers with correlation matrix of all the success factors in the research model (Appendix 1). Based on these findings a description of groups of success factors with meaningful high and moderate strength of correlation will be provided.

### **3.6.2.6 Questionnaire Procedure**

Following the whole questionnaire procedure, described by Fowler (1995), the questionnaire for this research was developed through five stages:

1. To produce a questionnaire basing on literature review in the area of success factors in projects and following recommendations about its design. Some aspects of this stage were covered in the previous sections.
2. To interview three to five project managers of construction companies in Addis Ababa in order to include options those were not covered by questionnaire before. As a result of this stage the framework developed on literature review was checked on applicability to Addis Ababa construction industry.
3. To add and to correct questionnaire (several features may be changed after the pilot questionnaire interviews). During this stage the summary of three semi-structured interviews (Appendix 3) was analysed. As an outcome the success factors framework will be proven to be applicable. Additional factors mentioned by respondents will be included in the existing framework.
4. To test questionnaire on small group of people (free persons) to understand its clarity. On this stage informant were required to describe their perception and understanding of categories. Therefore, interviewees were asked to describe their understanding of each factor to ensure that the meaning remain in the same language.
5. To spread the final printed questionnaire among housing construction project managers in Addis Ababa to 120 project managers in Addis Ababa who are mainly involved in housing construction projects. Answers appeared in the questionnaire will be imported to MS Excel for further analysis. Reminders and follow-up time plan described above was strictly followed to maximize the response rate. Analysis of the data obtained is presented in the following chapter.

### **3.7 Limitations of the research methodology**

Limitations of research methodology designs are mainly related to the main elements chosen to conduct the research.

*Research strategy:* Since survey was chosen as the main strategy of this study a problem of question interpretation might be a limitation of the study. Different understanding of the

questions might lead to a false conclusion or provide insufficient data for further analysis (Bryman and Bell, 2003)

*Data collection technique:* Questionnaire methodology also has some barriers and obstacles. Validity and accuracy of questionnaire data might be low considering the characteristics of respondents (Ticehurst and Veal, 1999). Two of the most serious concerns are possibility of low response rate to the questionnaire and inaccuracy in questionnaire design itself.

Sekaran (2003) suggest that 25-30 percent response rate might be considered as acceptable. Therefore, the validity of this type of data collection technique might be questioned as the other 75-70 percent's opinion is not counted (Ticehurst and Veal, 1999). Nevertheless, many authors states that this response percentage is sufficient enough in order to provide data for further analysis (Bryman and Bell, 2003; Saunders, *et al.*, 2007; Collis and Hussey, 2003). The other problem closely connected to the low response rate is discussed in the literature as 'uninformed response' (Saunders, *et al.*, 2007). This research will address this issue by targeting the questionnaire on the experienced project managers within the organizations.

Questionnaire design is another important area since the questions should be defined very clearly and related to the research topic (Ticehurst and Veal, 1999). Taking into account questionnaire gives the researcher only one opportunity to collect data further in-depth analysis becomes impossible if some areas remain unclear.

*Data analysis:* Quantitative approach in research strategy will not allow the researchers to explore the area at the same depth as qualitative research techniques (Saunders *et al.*, 2007). Therefore, data analysis will not be able to answer certain type of questions, for example those related to the reasons of one factor dominating the other.

### **3.8 Research Ethics**

Saunders *et al.*, (2007) states that any researcher who collect data, analyse and report findings might face ethical issues. Therefore, this sections aims to declare authors awareness in this area and highlight some particular issues regarding this study.

Since the main data collection technique of current research is questionnaire this area requires special consideration. Two ethical questions arise in this case: authorization from the respondents and further proper data analysis.

To receive the permission from the respondents to use their answers in the research cover letter was sent as a preamble to the questionnaire. It assured respondents that:

- Survey's purpose is entirely academic;
- Participation in survey is voluntary;
- By any chance any information cannot be traced back to the respondents or company;
- All the answers will be kept confidential.

To address the second issue of further data analysis all the questionnaires were standardized for respondents. No adjustments or changes were made during the questionnaire procedure.

However, there are other ethical issues related to data analysis as well. 'Objectivity is vital during analysis stage' (Saunders *et al.*, 2007) therefore it means that the validity of findings of this research should be well grounded. Different section of this thesis already addresses or will touch this question. Main sections which make this study objective describe limitations of the methodology and of entire research.

Reporting findings might be another ethical issue since authors should avoid choosing which information to report. Miss-reporting or not reporting part of the findings is unlikely to be acceptable in social science research since there are no true or false findings (Bryman and Bell, 2003). Therefore, it is researchers' responsibility to report findings honestly and precisely by providing all the data collected.

## CHAPTER FOUR

### DATA ANALYSIS AND DISCUSSION OF FINDINGS

This chapter focuses on analysis of data collected by a questionnaire from different Addis Ababa housing construction project managers and directly involved in housing projects. Even though this section presents description of the survey sample the main aim of it is providing the reader with a systematic analysis which helps to test the research hypotheses. This analysis is mainly based on quantitative data obtained from the respondents (Appendix 5).

Findings and discussion will be presented in order to realize the objectives of this study in the most efficient way being focused on the two research questions:

1. Significance of success factors in housing construction projects in Addis Ababa.
2. Identifying possible interrelations between success factors in housing construction projects in Addis Ababa.

Therefore, the **first part** begins with presentation of research flow and sample description. The main aim of this part is providing the reader with general information about research process and analyzing the quality of the sample which confirms the reliability of research.

It is then followed by **second and third parts** focused on analysis of different groups of factors and single factors which influence housing construction project success in Addis Ababa. Description of the findings is followed by detailed analysis from different perspectives in order to understand the underlying reasons of one factor being more important than others for achieving project success. These parts will serve in order to answer the first research question.

Second research question will be addressed in the **fourth part** of current section. By applying correlation analysis of the questionnaire scaling questions interrelation between different factors might be found. This part of findings and discussion will address this issue as well as discuss some possible causes of factor interdependences.

#### 4.1. Research Flow and Sample Description

Data collection for current research was done by distributing to those managers, coordinators site engineers, and office engineers by going to housing project offices by printing 100 questioners and 71 of these professionals replied and give back by reminding again and again.

The response rate equal to 71% response rate considered acceptable for this type of research.

Characteristics of the sample might prove that responses obtained from the individuals could to be extremely helpful in order to answer both the research questions. 49 of the respondents were project managers, 18 persons were directly involved in management of projects or described their job position as site supervisor or office engineer.

Only 5 respondents did not specify what type of managerial role they hold in the company.

Experience of the respondents might be a good indicator of sample precision (Saunders, *et al.*, 2007). (Table, 2) presents a summary of respondent's experience in construction projects managerial positions.

<b>Years of business experience</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative Percent</b>
less than 2 years	6	8.5	8.5
2-4 years	27	38.0	46.5
5-7 years	15	21.1	67.6
more than 8 years	23	32.4	100.0
Total	71	100.0	

*Table 2 Project managers' business experience*

Analyzing the data from this perspective it seems likely that the respondents had a vast experience in housing construction projects area (53.5% have more than 5 years on managerial positions, another 38% have more than 2 years). Therefore, responses obtained from such a sample might be characterized as 'informed' (Saunders, *et al.*, 2007) and used for further analysis.

The high quality of sample precision for answering the research questions is also supported by the fact that majority of respondents are involved in housing construction projects (81.7 % of the respondent's last project was in housing construction). Managers have chosen this option among others as a response for the check question in the survey. Refinery technique applied to the

questionnaire list proved its efficiency and helped to concentrate on project characteristics of particular type of projects. This sample parameter is another indicator which shows that the data might be analyzed in order to answer the research question and reach research objectives.

<b>Contractors Type of Last Project</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative Percent</b>
Housing construction	58	81.7	81.7
Civil engineering construction (bridges, roads, etc)	6	8.5	90.1
Industrial construction(plants, refineries)	1	1.4	91.5
Other type of projects	6	8.5	100.0
Total	71	100.0	

*Table 3 Respondents' type of last project*

As shown in (Table, 3) majority of the companies (70.4%) which took part in the research operate in different parts of the country. However, a company which only operates only in Addis Ababa is 24% percent.

<b>Company's scope of operations</b>	<b>Frequency</b>	<b>Percent</b>	<b>Cumulative Percent</b>
World wide	4	5.6	5.6
Addis Ababa wide	17	23.9	29.6
Different regions of Ethiopia	50	70.4	100.0
Total	71	100.0	

*Table 4 Respondents' area of operations*

Sample description by company size is presented in (Table, 4) almost half of the respondents work in companies with 100-500 employees. This group is followed by companies with 500–1500 employees. In addition, 10 responses indicated that more than 1500 employees work for the company and 14 responses indicated that less than 100 employees work for the company

Company size	Number of responses	Percent	Cumulative Percent
Less than 100	14	19.7	19.7
100-500	32	45.1	64.8
500-1500	15	21.1	85.9
1500-3000	10	14.1	100.0
Total	71	100.0	

*Table 5 Respondents' company size in terms of employees*

Sample description provided above deals with several important issues closely connected with the purpose of current research.

First of all, it helps to support general validity and reliability of data collected to test the research hypothesizes. Even being statistically unreliable the data contains responses of highly experienced managers which work in companies of different size and operates in different parts of the country. Moreover, all the respondents deal with housing construction projects. Therefore, such a sample might be still able to provide relevant data in order to answer research questions and explore housing construction industry of Addis Ababa.

Secondly, sample parameters might be used in further analysis of success factors from different perspectives. Impact of diverse factors in Addis Ababa mass housing construction might be different depending on the size of the company or region of company's operation. Therefore, sample description will be used as a basis for in depth analysis in subsequent parts.

This part comes to finalize findings on groups of success factors in construction projects in Addis Ababa at large in Ethiopia economy. It aims to clarify a priority of clusters for construction industry basing on results of questionnaire completed by project practitioners in Addis Ababa and other region of Ethiopia. Starting from a general description it dives into details eliminating possible tendencies and interrelations from different perspectives. An indication of dominative and supplementary groups of factors is considered as a desirable outcome of this part and will be a platform for a next step.

#### **4.2.1. Groups of Success Factors Overview**

(Figure, 10) presents each of group of project success factors with a weight it has in a common pool of factors, which in its turn is counted as 100%.

From this pie-diagram it is obvious that there are three groups of factors which might be recognized as a majority. Therefore, factors related to project management (22.16%), human aspect (18.12) and general management and organization (19.6%) impact dominate in construction projects in Addis Ababa.

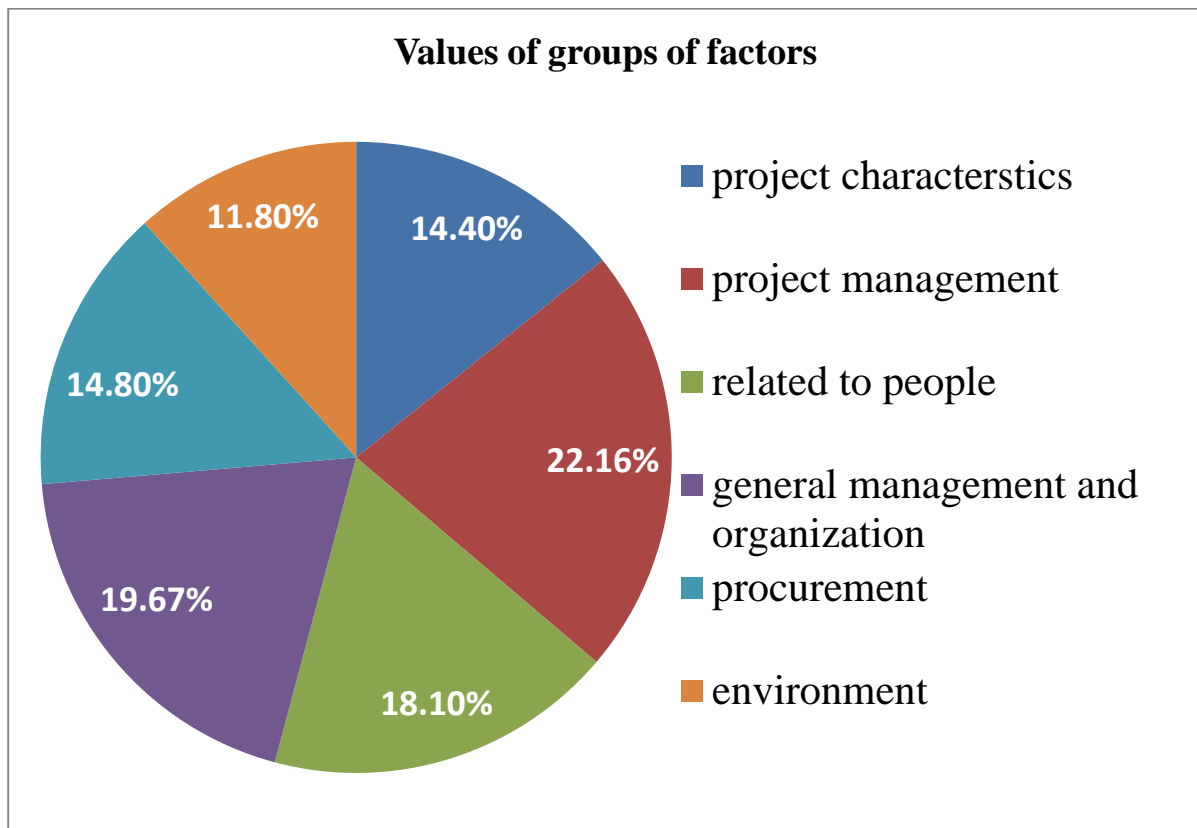


Figure 10 Values of groups of factors for construction projects in Addis Ababa

**Project management** group of factors was orientated on skills and techniques which are applied during the whole project life cycle: from its initiation phase to a project closure. It seems evident that this group deserves the highest attention from the site of project managers.

This group of factors represents the first focus in studies on success factors. Initially levers of project success were referred to a planning and scheduling from 60s (Belassi and Tukel, 1996) and this focus has been under attention in later studies also. It is likely that planning, control and communication have a huge impact on a project outcome as well as decision making ability.

**General management and organization** group of factors that shows top management strategic leadership and support to responsible leader who follows the project day to day execution is highly important. In this regards change management in project happens and understanding this issue is critical in risk management of the project that may encounter since housing project is

directly related to citizen's top focus until their life time and completion of the project timely with acceptable budget and to the minimum required quality is not easily attained unless focus is given to change management. The other factor that deserves to successful completion of the housing project is the organizational structure that best fits the scope of the project that helps to fit the purpose of the organization business needs by updating timely with the complexity of the project and governing factors with best performing peoples that meets the requirement set to deliver quality expected output.

**A human factor** takes place in the list of the most influential group of factors for Addis Ababa housing constructions. This cluster involves a big variety of project participants which were selected as dimensions. Therefore, it includes a wide spectre of factors which are aligned to each dimension. For instance, under client dimension there are clients' knowledge, experience, size and type and this has equal impact for contractors and consultants who participate in the project. It seems possible that the wider cluster is, the more importance for project success it has. Consequently, the more precise analysis of single factor is required in order to measure qualitative influence rather than quantitative.

Another three groups of success factors were valued almost equally. Thus, factors related to procurement were given 14.80%, whereas project characteristics and environment groups received 14.4% and 11.80% accordingly. The rank of procurement related factors appears high which appeared expected due to its significant role particularly in Addis Ababa housing construction projects. However, to find a reason of the contradiction factors under this cluster have to be analysed separately and in depth. In addition, environment seems to be slightly neglected since common political environment, economic environment; technical and technology is found in Addis Ababa.

#### **4.2.2. Groups of Success Factors Analysis**

Besides the general description of data on categories of factors received from questionnaire, a necessity to study this information from various perspectives is likely to be evident. The following correlation was done between project criteria and success factor with below Pearson correlation coefficient (r value).

	project characteristics	project management	related to people	general management and organization	procurement	environment
time	0.028	0.034	0.19	0.192	0.188	0.184
budget	-0.233	0.019	0.081	0.13	0.119	0.182
quality	-0.72	0.09	0.143	0.125	0.023	0.03
stakeholders' satisfaction	0.059	-0.169	0.004	0.154	0.097	0.031
project purpose	0.043	0.066	0.206	0.206	0.007	0.054

Table 6 Pearson correlation coefficient between project criteria and success factors

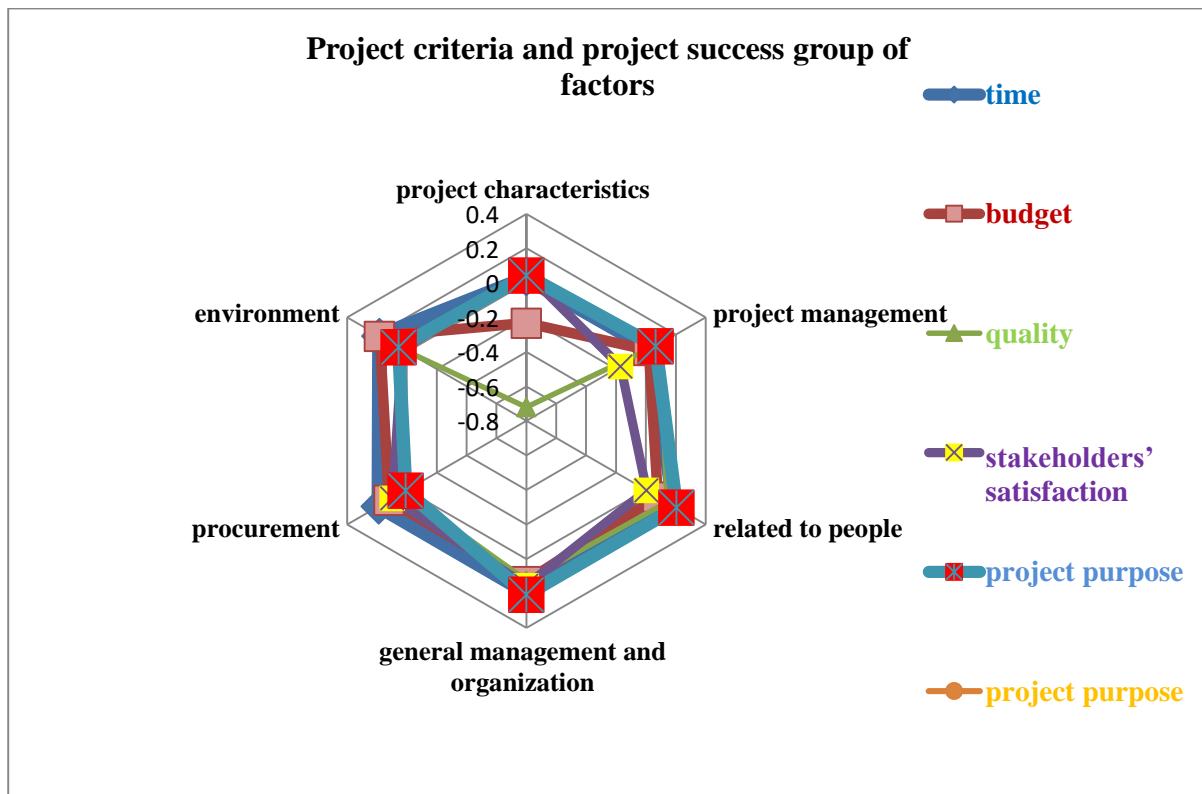


Figure 11 Project success criteria and project success groups of factors

Axes on this graph indicate project groups of factors; however, net-curves illustrate how important each group of factors was with a respect to project success criteria.

From the radar diagram it seems obvious that there is negligible strength of association between groups of success factors regarding project success criteria. This fact implies that solid conclusions are not possible; however, some ideas might be developed.

As could be seen from the radar diagram there are small correlation values. Thus, project general management and organization and human factor was indicated as a 'highly important' in case of project purpose. As was mentioned above questionnaire was purposely build with a reference to the last project completed by respondent.

Therefore, it appears logical that project managers who succeeded with their last project in terms of achieving project purpose indicated general management and organization and human factor category as a highly significant for their last project success.

High quality project delivery points on somewhat bigger importance of with all success factors except project characteristics which is least insignificant. In spite of the fact that project quality delivery with respect to project characteristics factors were stressed by studies in construction field, it seems ignored. This relation seems to be ambiguous and requires detailed analysis considering each factor.

Budget success has an extremely low value on project characteristics axe. This relation seems to be ambiguous and requires detailed analysis considering each factor.

Projects which successfully met stakeholders' expectations were connected to a bit higher importance of organization and corporate management than other projects. Moreover, projects with a successful outcome in terms of stakeholders' expectations recognize groups of factors similarly to projects which have success in terms of achieving project purpose and time required for project completion. Therefore, to satisfy stakeholders' expectation for project manager is likely to be associated with an overall project goal and time.

Group of project characteristics is likely to be insignificant regardless success criteria. However, general management and organization aspect is equally important for each of the performance indicators.

In spite of attempt to explain some indicators from the diagram it seems important to mention again that strong conclusions in this case would be ungrounded as small deviations presented on the graph appear statistically insignificant.

Categories of success factors were analysed regarding project managers' experience. (Figure, 12) demonstrates how average rank of groups of factors (which represent arithmetical averages) is changing with a variation in experience of respondents. Some trends could be noticed on this chart.

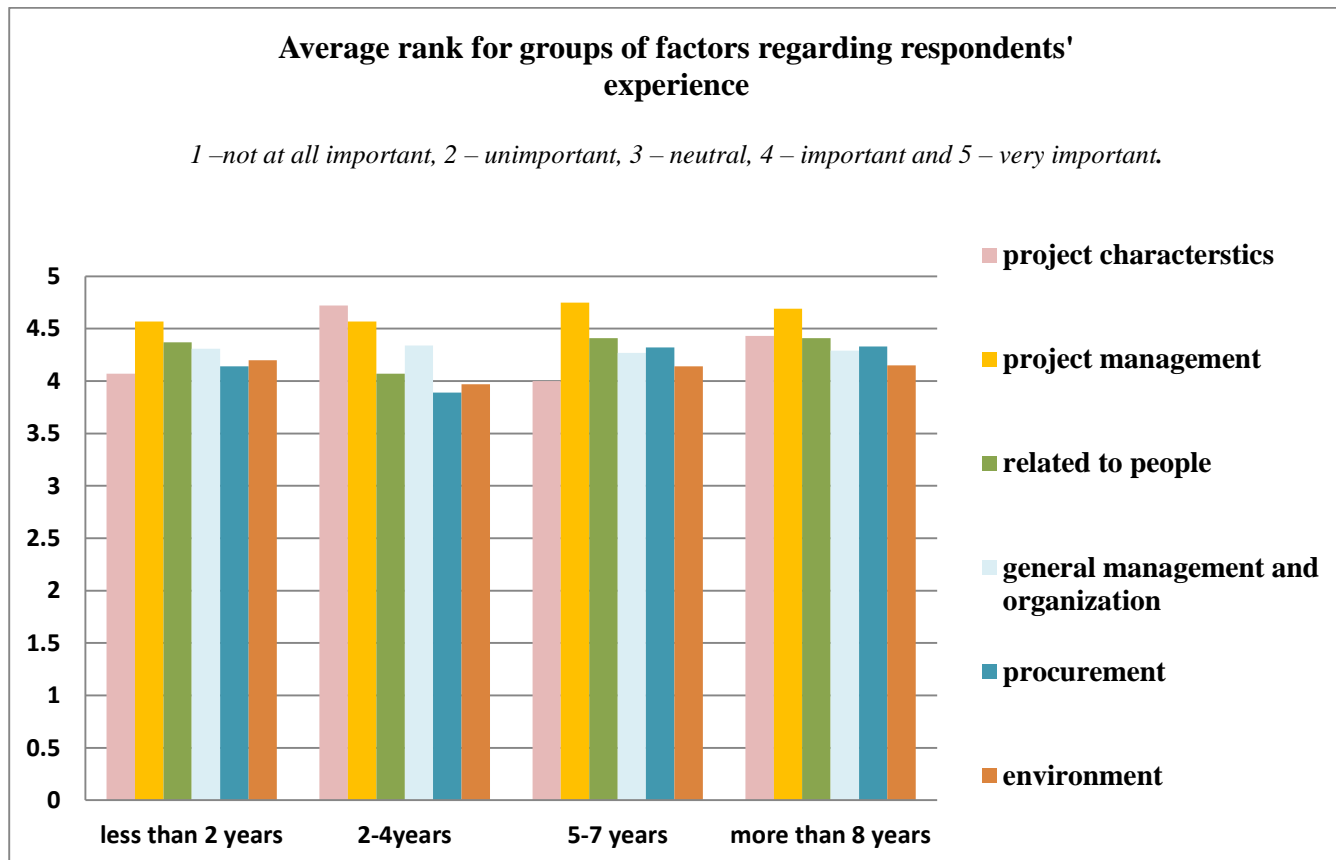


Figure 12 Average ranks for groups of factors regarding respondent' experience

Thus, factors related to related to project management in project tends to increase their importance compared to other success factor categories with an increase in project manager's years of experience. It might be connected to the fact that more understanding to project management is gained through years of experience increases and this is the fact in real construction industry.

Despite of existing tendencies some groups appear to remain stable or changing insignificantly. In this way project characteristics, related to people, procurement and environment category seems changing up and down without a particular trend; project general management and organization group also looks almost like a horizontal line stressing its steadfast importance on project outcome. Environment and procurement success factors between years of experience 2-4 respondents felt neutral. Generally, it seems challenging to find a trustful explanation on trends which do not have clear motions.

An investigation on significance of groups of factors according to project profitability was measured and analysed. (Figure, 13) illustrates changing dependence in significance of groups according to increase in project profitability. Average ranks of groups of factors were calculated as a normal arithmetical average with respect to a number of responses in each profitability cluster.

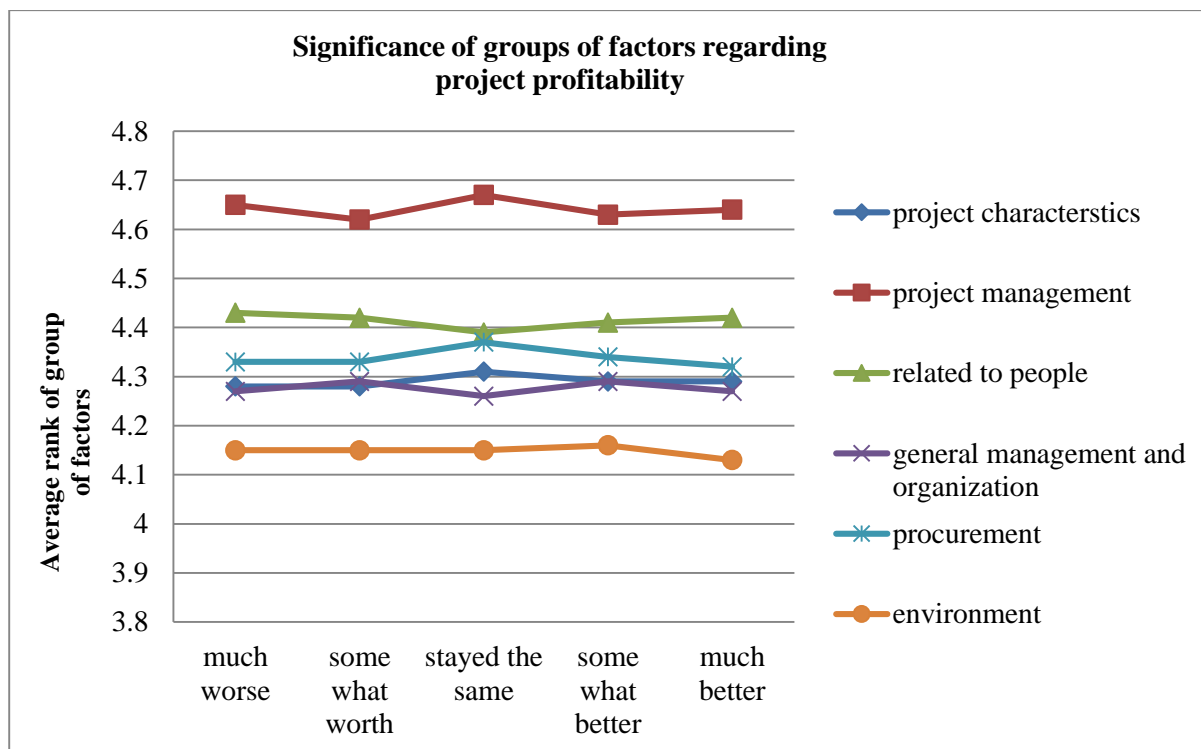


Figure 13 Changing significance of groups according to a project profitability growth

From the figure above trends could attract an attention. The first trend might be seen in a decrease of the importance of procurement group. This fact might relate to a possible high involvement of client's supply of material to the project. This fact might relate to possible inefficacy of timely supply of material by tendering procedure and effectiveness and the purchasing capacity compared to decrease in profitability.

The second trend might be seen in a decrease of the importance of environmental group. This fact might relate to a possible insurance actions implemented to secure projects with acceptable profits.

It also might be possible that environmental factors were one of the main reasons of some project failure in terms of profits and therefore they are highly ranked for this slot. For instance, economic crisis, foreign currency crisis to import materials might provoke unprofitable outcome as expected for prolonged constructions. Besides the fact that environment group was highly

evaluated for projects with a very low index of profitability the next cluster of financial efficiency changes its significance dramatically.

Another tendency might be seen in a group of factors related to a project characteristic. The fluctuating curve represents somehow an increasing trend. In terms of shape it looks similar to general management and organization, procurement and project management group curves.

In general project management and human factors stay over other groups which stress them dominate position regardless profitability of projects.

### 4.2.3. Summary for Groups of Factors Discussion

Summing up written above, it is possible to conclude that six groups of factors were clearly divided on two segments (Figure 14):

- Primary project success areas with a high priority groups of factors (project management, human and general management and organization factors), and
- Supporting project success areas with the lower significance of groups of factors (project characteristics, project characteristics, environment)

This fact appears evident from the (Figure 10) where primary success area received almost twice more attention in terms of significance than supporting area groups. Moreover, considering results of analysis on project success criteria and success factors (Figure 11) the primary success area seems dominative as well.

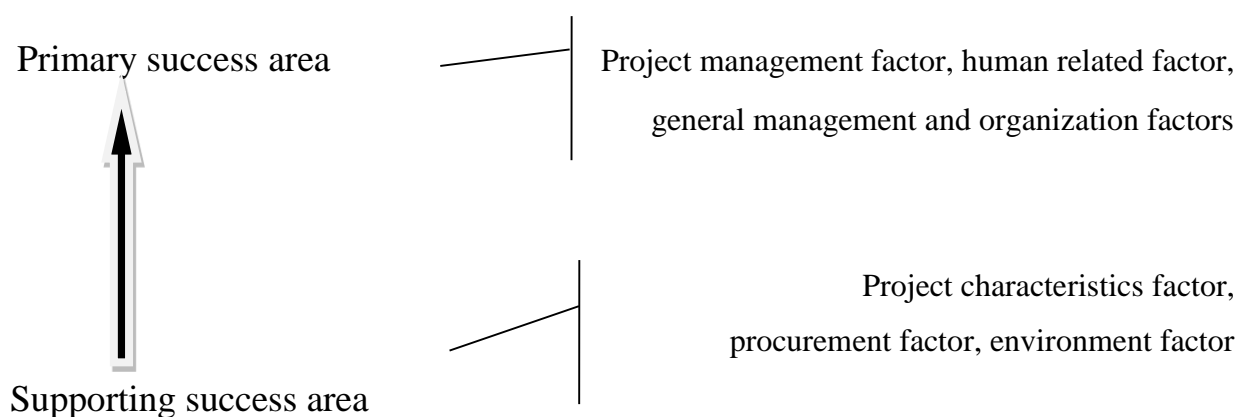


Figure 14 Summary of group analysis

### 4.3. Success Factors Discussion

This part aims to develop an analysis of significance of each project success factor in Addis Ababa construction industry regardless groups in which they were accumulated at the previous step of research. A final list of success factors ordered according to their significance for Addis Ababa housing construction industry is expected as a contribution of this part to the whole study. It is going to be based on the results of previous part of current research: to analyse primary success area only.

#### 4.3.1. Success Factors Overview

(Figure, 15) below represents arithmetical average of ranks which were assigned to each of success factor by respondents. The scale from 1 to 5 refers to the following grades: 1 – not at all important, 2 – unimportant, 3 – neutral, 4 – important, and 5 – very important.

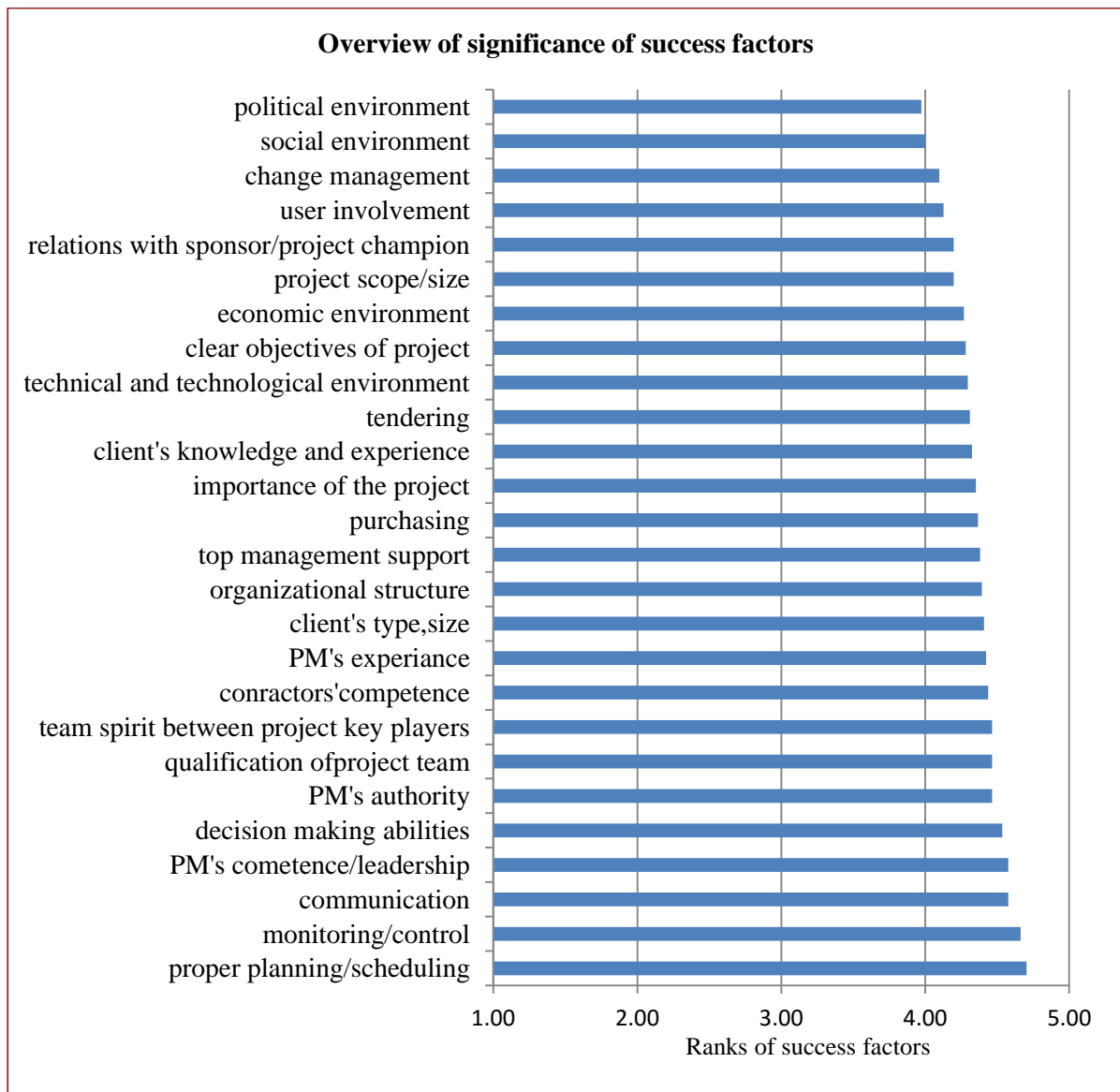


Figure 15 General overview of success factors significance

The average ranks of success factors on the chart are demonstrated in an ascending order from the less significant factor to the high important.

As could be seen from the chart above the majority of factors leading project to successful outcome were characterized as 'important'. Some of them receive equal or similar ranks and therefore it seems complex to define differences between such factors and explain them. Therefore, minimum and maximum values on a rank scale offer more interest for discussion.

There are few factors which are located in the 'neutral' zone; it is the lowest value rank which was received. Social environment and political environment were allocated to this grade.

Social factors seem to be undervalued in Addis Ababa mass housing construction industry. Although this factor was strongly emphasized as a significant lever in project success by Akinsola et al. (1997), Kaming et al. (1997), it is positioned close to scale's minimum by respondents for this study.

Political environment was addressed as the least significant power in a project success in housing constructions in Addis Ababa. This may imply that Addis Ababa is the sits of the federal government and international organizations and level of confidence is high and less significance is given for this factor in housing projects.

Under the 'very important' for project success rank (grade from 4 to 5 on the chart) the following factors were assigned:

**Project success ranked 4.5 to 5 which are very much important**

- ✓ Proper Planning/Scheduling
- ✓ Monitoring/Control
- ✓ Communication
- ✓ Project manager's Competence/Leadership
- ✓ Decision Making Abilities

**Project success rank 4 to 4.5 which are very important**

- PM's Authority
- Qualification Of Project Team
- Team Spirit Between Project Key Players

- Contractors' Competence
- PM's Experience
- Client's Type, Size
- Organizational Structure
- Top Management Support
- Purchasing
- Importance of The Project
- Client's Knowledge and Experience
- Tendering
- Technical and Technological Environment
- Clear Objectives of Project
- Economic Environment
- Project Scope/Size
- Relations with Sponsor/Project Champion
- User Involvement
- Change Management
- Social Environment

From the comparison above it might be seen that almost all success factors evaluated as 'highly influential' on project success were originally ascribed to groups which also receive the highest priority (primary success areas) are the project management group of factors which comprises four out of five in the very much important influencing factor.

It seems likely that being a strong force that project management in a project success, as it was stressed by high reputable institution and author; The Project Management Institute (PMI) described project management as "the application of knowledge, skills, tools, and techniques to project activities to meet project requirements" and characterized "high quality projects deliver the required product, service, or result, within scope, on time, and within budget" (PMI, 2004). Similarly, Kerzner (2001) characterized project management success as the completion of an activity within the allocated time, at or under budget, to specified performance levels and the satisfaction of the client.

One out of the five with very much important factor is the project manager's competence/leadership that grouped in the human group of factor. In the human group of factor there are ten factors and project manager's competence/leadership that assigned on mass housing

project construction is the highest influencing factor that the towering attention shall be given critically from the analysis. This result is similar to Bayliss, (2002) in his report said that successful project delivery requires the concerted effort of the project team to carry out the various project activities, but it is the project manager who, at the centre of the project network, is responsible for orchestrating the whole construction process.

The very important influencing group of factors grouped from the rank showed (4 to 4.5) the total 26 the 25 are very important and this shows how almost all factors are considered very important to housing projects in Addis Ababa. In this group success factors related to people get the highest priority 9 out of 20 which almost half of the very important ranked factors. This implies that factors related to people who will be assigned on housing project is positioned as a principal focus to be given. Belassi and Tukel, 1996, categorized success factors into four main group. These are factors relating to the project, project managers, organization, and external environment. Others researcher, Chan et al., 2002 identify a set of project success factors; project team commitment, contractor’s competencies, risk and liability assessment, client’s competencies, end-users needs and constraints imposed by end user. Political environment from the factors were evaluated on the border between ‘important’ and ‘neutral’.

In the summary of groups of factors analysis, the three most influential categories in (Table, 7) in terms of project success were selected and defined as ‘primary success areas’. It was done as a step to list of project success factors formulation. After the most powerful groups were identified the main focus of present research will be on a studying of success factors which belong to those groups.

<b>Group of success factor</b>	<b>Total rank weight (from 113.28)</b>	<b>Total success factors (from 26)</b>	<b>Rank</b>
Related to people	39%	38%	1
Related to project management	16%	15%	2
Related to environment	15%	15%	3
Related to general management and organization	11%	12%	4
Related to project characteristics	11%	12%	4
Related to procurement	8%	8%	5

*Table 7 Most influential groups of factors analysis*

### 4.3.2. Success Factors Belonging to the Project People

Following (Figure, 16) presents arithmetical average of ranks attributed to success factors from people group on the project.

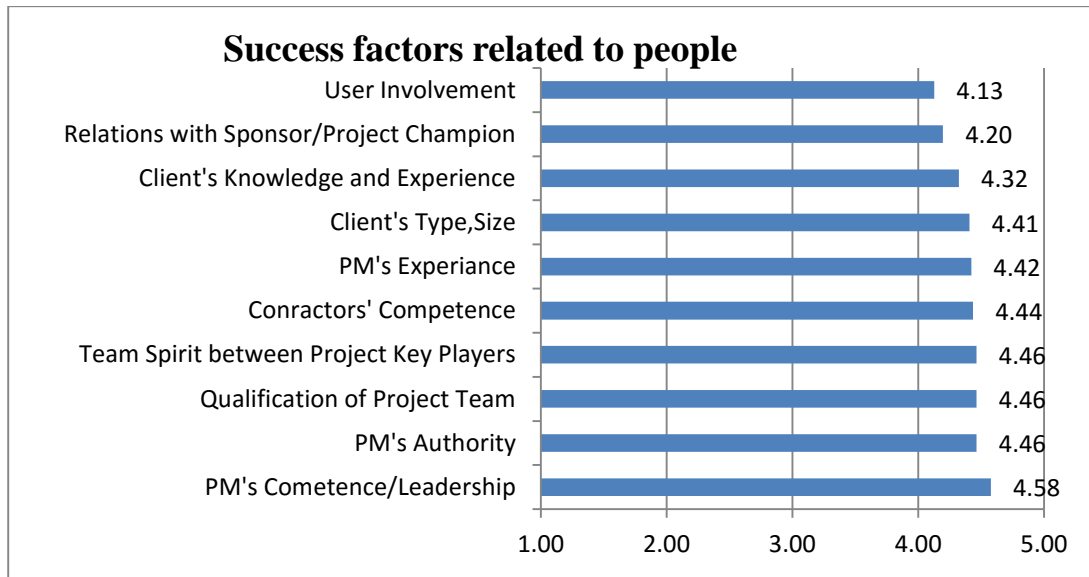


Figure 16 Significance of success factors related to the human group

Project managers' competence and leadership seems to be the most valuable variable. Abu Baker et al. (2009) reveal that a competent project team occurred in all of the identified author's frameworks and as such is prioritised and ranked 1<sup>st</sup> as the most critical success factor. This is followed closely by the project manager authority/leadership which appears in six out of the eight identified author's frameworks in the literature, thereafter prioritised and ranked 2<sup>nd</sup>. At the same time, the study results indicate that of the eight author's frameworks, four out of the fifteen critical success factors appear common in five of the author's frameworks such as: At the same time, the study results indicate that of the eight author's frameworks, four out of the fifteen critical success factors appear common in five of the author's frameworks such as: project understanding; top management support; client involvement; and project mission/common goal. While critical success factors as: information/communication; realistic cost and time estimates; and adequate resources for project are identified as common in four of the frameworks and ranked as 4<sup>th</sup> in the set of the critical success factors for project success.

### 4.3.3. Success factors belonging to the project management group

Following (Figure, 17) illustrates a significance of each factor from project management group.

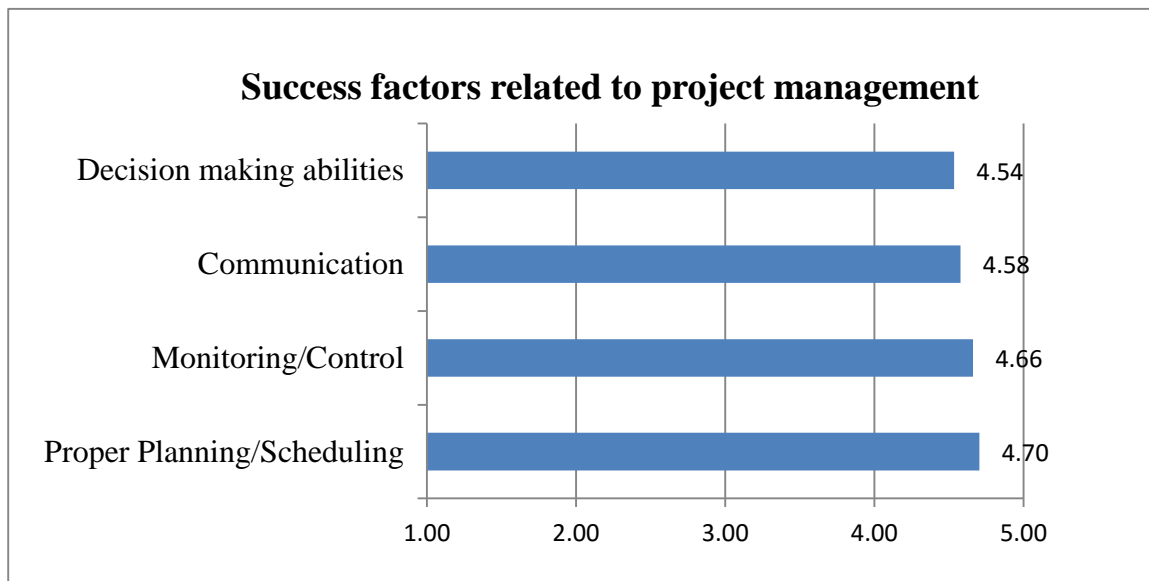


Figure 17 Significance of success factors related to project management group

Planning leads this group of factors following by control. Both of these factors are recognized by many sources as the most relevant on the way to success, which is discussed in details in literature review of current study. Communication seems to be a part of a whole chain: producing a plan, sharing goals via communication channels and control of execution. Decision making abilities remains the least important factor in this group. It contradicts to the findings of Belout (1998) and Yu et al. (2006) who emphasize an importance of this factor for overall project success.

### 4.3.4. Success Factors Belonging to Environmental Group

(Figure, 18) provides average ranks for success factors related to the environment.

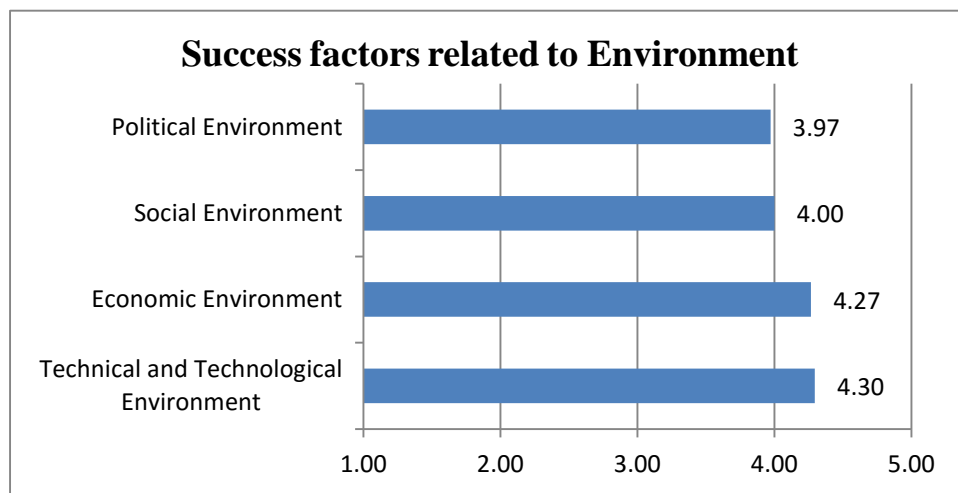


Figure 18 Significance of success factors related to the environment group

As could be seen from the (Figure, 18) technical and technological factor is the most significant for housing construction projects in Addis Ababa.

The designers, manufacturers as well as contractors in addition to traditional project objectives (i.e., time, cost, quality, and safety), productivity and sustainability the technical and technological advancement to housing project objectives has high influence. This is due to the rapid urbanization process and the growing demand to residential buildings and the recent urban growth has been unprecedented, mainly as a result of rural-urban migration, resulting in growing welfare and housing problems for the new urban poor, and increasing urban unemployment.

Strict technical and technological housing construction measures should be adopted in the design, and construction of mass housing construction project in order to achieve the objectives objective and satisfy the beneficiaries. These measures include fewer design changes, more effective materials logistics management, a higher degree of standardization, and some more reliable project management components.

The next project success lever is the economic weight of towns in Ethiopia is also reflected in increased concentration of people in urban areas. The development and implementation of a sustainable urban infrastructure and housing finance system should form as a critical element of future urban development implementation strategies. Here the primary focus should be on improving domestic savings and revenues for infrastructure and housing developments. The experiences so far with regard to public participation in planning, delivery, and management of infrastructure, housing, and services as well as other governance issues need to be consolidated further in the future. Finally, the undergoing initiatives of strengthening the urban planning, design and construction capacities need to be consolidated further to ensure better quality, cost efficiency and productivity in housing delivery (State of Addis Ababa 2017 report).

The third success factor is social environment. Ethiopia has yet to establish and strengthen a housing finance sector that is flexible and diversified in providing loan for the construction of housing. In particular, improving access to housing finance for the majority of low-income urban households to own affordable houses remains a serious challenge. The effort to building low-cost condominium houses that are affordable by low-income residents through the government's large-scale Integrated Housing Development Program is an experience that deserves close examination. In this respect, while the construction of the condominium houses was at low-cost it seems that many low-income urban residents cannot afford owning the houses (State of Addis Ababa 2017 report).

The least environment success factor is political environment. Lack of a strategic and comprehensive approach to housing policy was cited as major factors why Ethiopia has performed poorly in terms of the provision of affordable housing to the poor. Since the introduction of the 2005 urban development policy, however, major policy changes can be observed (State of Addis Ababa 2017 report).

#### 4.4. Success Factors Interrelationship

The main aim of this part of the research is presenting and discussing data findings based on the correlation analysis of the scaled by respondent's success factors. By doing so researchers plan to address the second research question and find possible relationship between different factors as well as discuss possible reasons of its existence.

It is widely argued in the literature which size of coefficient of correlation corresponds to which level of interdependence. Hair *et al.* (2007) suggests applying the 'rules of thumb' when analysing data for business studies See (Table, 8).

However, Cohen (2003) argues that in social science even small correlation coefficients like 0.3 refer to medium association. In addition, both Cohen (2003) and Hair *et al.* (2007) agrees that interpretation of coefficients depends on the purpose of study and therefore they are 'only suggestions and other guidelines are possible'.

Therefore, both the approaches suggested by Cohen (2003) and Hair *et al.* (2007) were considered. For current research factors with strength of association more than 0.7 were considered highly correlated. Medium correlation was considered between 0.4 and 0.7. Correlation coefficients below 0.4 were not considered due to a high probability of being statistically insignificant.

Correlation coefficient range	Strength of association
0.91 – 1.00	Very strong
0.71 – 0.90	Strong
0.41 – 0.70	Moderate
0.21 – 0.40	Small
0.00 – 0.20	Negligible

Table 8 Rules of thumb [Adopted from Hair *et al.* (2007)]

Based on the Table 8 Highly correlated success factors are;

	Monitoring /Controlling	Importance of The Project	Relations With Sponsor/Project	Project Manager's Experience	Proper Planning/ Scheduling	Qualification of Project Team	Project Scope /Size
<b>Communication</b>	0.888						
<b>Project Scope /Size</b>		0.833					
<b>User Involvement</b>			0.818				
<b>Project Manager's Authority</b>				0.811			
<b>Monitoring Control</b>					0.724		
<b>Clients Type/Size</b>						0.714	
<b>Clear Objectives of Project</b>							0.71

Based on the Table 8 Moderately correlated success factors are;

	Importance Of The Project	Project Scope /Size	Clear Objectives Of Project	Proper Planning/Scheduling	Monitoring Control	Communication	Pm's Competence/Leadership	Pm's Experience	Pm's Authority	Qualification Of Project Team	Clients Type/Size	Clients Knowledge And Experience	Contractor's Competence	Relations With Sponsor/Project Champion	User Involvement
Clear Objectives of Project	0.647														
Proper Planning/Scheduling			0.432												
Communication				0.621											
Decision Making Abilities				0.661	0.656	0.633									
PM's Experience							0.696								
PM's Authority							0.696								
Qualification Of Project Team							0.521	0.493	0.612						
Clients Type/Size								0.437	0.563						
Clients Knowledge and Experience								0.664	0.556	0.492	0.596				
Contractor's Competence								0.479	0.312	0.529	0.544	0.518			
Relations With Sponsor/Project Champion		0.418						0.419	0.450	0.584	0.543	0.543			
User Involvement								0.418	0.559	0.560	0.560	0.416	0.436		
Team Spirit Between Project Key Players					0.415	0.412			0.452	0.591	0.450	0.490	0.509	0.592	0.598

Since the main objective is finding relationship among different factors as such the sign of correlation coefficient will not be considered. Absolute values which correspond to strength of relationship will be analysed. For this research highly correlated success factors are analysed.

A complete analysis is presented in Appendix 5.

#### 4.4.1. Analysis of Highly Correlated Success Factors

The summary of findings related to analysis of highly correlated success factors in housing construction projects is presented in (Table, 9). A detailed discussion about each pair of factors will be presented below.

	Monitoring /Controlling	Importance of The Project	Relations With Sponsor/Project	Project Manager's Experience	Proper Planning/ Scheduling	Qualification of Project Team	Project Scope /Size
<b>Communication</b>	0.888						
<b>Project Scope /Size</b>		0.833					
<b>User Involvement</b>			0.818				
<b>Project Manager's Authority</b>				0.811			
<b>Monitoring Control</b>					0.724		
<b>Clients Type/Size</b>						0.714	
<b>Clear Objectives of Project</b>							0.71

Table 9 Highly correlated success factors

#### Communication AND Monitoring /Controlling

This pair of success factors correlation coefficient is the highest one in current research. Being equal to almost 0.9 it indicates a very strong association between the two factors. It might be concluded that success in housing construction projects in Addis Ababa if mainly dependent on communication will require managers' attention to project monitoring and controlling as well.

Effective communication on housing construction is important for all components of the project work, but is extremely essential to the success of project monitoring and controlling. This is because project monitoring and controlling results must feedback in to the project execution process inevitably involves multiple stakeholders in the project organization. Effective monitoring and controlling also requires that an ongoing cycle of questioning and reflection takes

place in relation to the project data produced thorough time bases as required to get reliable information.

To ensure the communication work is strategic and the outputs are of a high quality, their needs to develop a communication plan and this plan must be monitored and controlled. After the plan needs to ensure that systems and processes are in place for managing project delivery (such as project plan, Gantt chart, routine meetings, and reporting). Just ensuring that communication activities and products are identified, and that they are realistic, given your resources, should be enough.

This fact is also supported by literature. Aligned actions between project team players, project sponsor and customer are of particular importance for achieving project goals and successfully delivering the final result (Hassan, 1995). A study carried out by Larson (1995) about 280 construction projects also point out several important aspects. First of all, relationship inside the project team should be collaborative and result orientated, which requires continues communication process among the members. Secondly, the author stresses a particular importance of communication between project sponsor and project manager who are likely to be considered as key players. Moreover, special communication procedures inside project team (Chua *et al.*, 1999) increase the effectiveness of decision making process and increase a probability of success. Eckbald and Ashcraft (2013), in their analysis of several building projects in the United States and in India, identified setting of clear project monitoring and controlling goals and open channels of communication as critical success factors.

### **Project Scope /Size AND Importance of the Project**

This pair of success factors correlation coefficient is the second highest one in current research. It might be concluded that success in housing construction projects in Addis Ababa is dependent on project scope/size will require managers' attention to project importance as well.

The work and resources that go into the creation of the housing construction are essentially the things that the scope of the project. The scope of project outlines the importance of the project and the goals that need to be met to achieve a satisfactory result.

The Addis Ababa Housing Agency (2012) also reports that the city has approximately 380,000 units of housing deficits.

Among the chief divers of the housing in the City of Addis Ababa are access to and affordability of urban land, the absence of housing finance mechanisms and affordability of the construction materials and design industry.

Total housing stock comprised of low quality housing 70-80% (The 2007 Population and Housing Census, 2010) in the city and its population in 2013 is 3.8 million with population growth rate 3.8% per annum (Central Statistical Agency). This shows the importance of housing projects for the city administration to give priority by maximizing the size of the project in different techniques to meet the required service delivery.

To address the acute urban housing problems, various approaches have been experimented of which the Integrated Housing Development Program (IHDP) that was first introduced by the Addis Ababa city administration in 2004 was found to be a worthy exercise that was immediately scaled up to address the urban housing problem in the country. The development of the national IHDP in 2006 capitalized on the experiences of Addis Ababa city administration between 2004 and 2005 that had introduced new ways of delivering low cost affordable housing to urban residents (MoWUD, 2008).

The IHDP was funded through acquisition of government bonds from the Commercial Bank of Ethiopia (CBE), which during previous years provided loan only for commercial purposes. Since 2006, an arrangement was made for the regions to sell bonds and access CBE loan to finance implementation of the IHDP. Accordingly, by the end of 2011, the CBE provided ETB 3.2 billion in bonds to the government towards implementation of the IHDP, whereas it received a return of ETB 2 billion (USD 153 million). Thus, CBE provided funding to implement the total cost of the program. The Federal government and regional states also made an exemption of Value Added Tax (VAT) on import of all building materials and machinery for use by the IHDP. The program was made to recover 100% of its cost with its beneficiaries paying the cost of housing construction while the cost of land and infrastructure was made to be recovered through the sale of commercial units which was about 6.6% of the number of houses in an auction (National Report on Housing & Sustainable Urban Development, 2014).

### **User Involvement AND Relations with Sponsor/Project Champion**

This pair of success factors correlation coefficient is the highest one in current research that the Addis Ababa City Administration needs to prioritize in its housing development accomplishments through its responsible institution for housing project.

Successful housing construction projects are designed, built and equipped to meet users' needs. Whether it concerns the function and expression of an entire building or the design of a single space, users hold a unique knowledge, which should be integrated properly in the design to ensure a successful housing project.

User involvement can be related to the citizen participation movement, especially in connection with housing development. In 1969, Arnstein introduced the ladder of citizen participation model focusing on municipality–citizen power relationships in various processes. Arnstein (1969) suggests that if citizens are given more power, the quantity and quality of decisions will increase. Arnstein's model, though criticized for considering only power aspects (Tritter and McCallum 2006), has been widely used by academics and practitioners since its publication as a basis for introducing, analysing, and developing user involvement. Conclusions from earlier research suggest that user involvement should include a variety of knowledge, experience, and expertise (Tritter and McCallum 2006).

To extract this knowledge and translate it into a consistent design requires a systematic and coherent approach to user involvement. It is necessary that the project sponsor needs to understand the user's background, surroundings and future use of the housing building and to organize a design process where the user needs are included at the right times in the design and construction process.

User involvement (UI) in planning, designing, and assessing the built environment has attracted attention in academia and practice for more than 40 years (Richardson and Connelly 2005).

The advantages of planning processes that involve users are outlined by several authors (e.g. Olivegren 1975; Lerup 1977; Albrecht 1988; Frost 2004; Tzortzopoulos et al. 2006; Nilsson et al. 2011). Over the years, motives for users' involvement have shifted from power distribution to the collection of valuable knowledge (Granath and Lindahl 1996; Till 2005). Later, users are viewed as active participants and co-creators of products, but less so in building processes where users are still viewed as consumers (Sanders and Stappers 2008).

Other studies of the early stages of building design processes have demonstrated that users have difficulties in exchanging information with architects that goes beyond concrete functions and structures (Luck and McDonnell 2006). In addition, information about household lifestyles and values in housing production might have limited worth (Jansen 2012). To engage with users, professionals need conversational skills (Luck 2007a). The use of various facilitating methods and visualization tools has become increasingly important. Drawings, models, and product samples can foster interaction between building industry professionals and users (Capjon 2004; Luck 2007b).

### **Project Manager's Authority AND Project Manager's Experience**

Role of project manager in housing development process generally, the project manager is appointed to serve client needs in managing the project as a whole and leading the project team to achieve the client's objective. A project manager experience in the housing project management process can play an important coordination role in providing the necessary link between the client and the project team, eliminating the dispute, enhancing team productivity and synergy. It is only when project managers assume leadership roles that construction projects achieve objectives measured against time, cost, quality, and customer satisfaction.

Project managers in construction are responsible for the overall success of delivering the owner's physical development within the constraints of cost, schedule, quality and safety requirements. As such they play a crucial role (Edum-Fotwe and McCaffer, 2000).

Nur Maizura [18] has carried out the study on the project manager role throughout the project development process base on RIBA plan of work. First developed in 1963, the RIBA Plan of Work is the definitive UK model for the building design and construction process. (<https://www.ribaplanofwork.com/> )

## Project manager roles according to RIBA plan

Development stages	Critical roles of PM
I) Inception	<ul style="list-style-type: none"> <li>• Accept appointment from client.</li> <li>• Arrange meeting with client.</li> <li>• Gather and obtain information from client.</li> <li>• Communicate with design consultant on project inception.</li> </ul>
II) Feasibility	<ul style="list-style-type: none"> <li>• Evaluate brief from client and advice client on the project feasibility study.</li> <li>• Carry out feasibility study based on client requirement and project nature.</li> <li>• Gather advice and information from design consultant on feasibility study.</li> <li>• Prepare feasibility study report.</li> </ul>
III) Outline Proposals	<ul style="list-style-type: none"> <li>• Ensure the client need and requirement is delivered to architect and design team and ensuring the design is sound and performs accordingly.</li> <li>• Gather all project information from design consultant for project scheme design.</li> <li>• Propose alternative on project program, schedule, technical problem and etc.</li> <li>• Obtain client agreement on the proposals outline.</li> </ul>
IV) Scheme Design	<ul style="list-style-type: none"> <li>• Ensure the design and specification is compiled accordingly.</li> <li>• Detail Proposal on project design, schedule, cost, technical problem and etc.</li> <li>• Reconfirm from client on the project schedule and cost.</li> <li>• Obtain client agreement on the scheme design.</li> </ul>
V) Detail Design	<ul style="list-style-type: none"> <li>• Obtain final decision on every matter relate to design, specification, construction and cost.</li> <li>• Ensure the design and specification is compiled as client requirement.</li> <li>• Complete the cost checking for the design.</li> <li>• Obtain client agreement on the detail design, specification and cost.</li> </ul>
VI) Production Information	<ul style="list-style-type: none"> <li>• Advice client on time and cost impact if there is any change on the requirement.</li> <li>• Ensure the design and specification is compiled as client requirement.</li> <li>• Review all the design, drawing, specification and all the details to carry out work.</li> <li>• Ensure all the product information such as drawing, schedule and specification is complete and ready for tender purpose.</li> </ul>

VII) Tender Action	<ul style="list-style-type: none"> <li>• Assist client in evaluate the selected contractor in term of capability, resources, experience, past project record, cash flow, etc.</li> <li>• Advice client on the selection of suitable contractor.</li> </ul>
VIII) Project Planning	<ul style="list-style-type: none"> <li>• Preparation of contract document.</li> <li>• Ensure all information, drawing, specification is ready for construction work.</li> <li>• Held site meeting with contractor for monitoring site progress and solving technical issue.</li> <li>• Monitoring and controlling on site progress, quality and cost.</li> </ul>
IX) Operation on Site	<ul style="list-style-type: none"> <li>• Held site meeting with contractor for monitoring site progress.</li> <li>• Held client-consultant meeting for solving technical issue and decision making purpose.</li> <li>• Monitoring and controlling on site progress, quality and cost.</li> </ul>
X) Completion and Feed-back	<ul style="list-style-type: none"> <li>• Ensure all the construction work is complete by the contractor as agreed.</li> <li>• Final inspection on completed building and arrange for hand over process.</li> </ul>

*Table 10 Project manager roles according to RIBA plan*

Extracted form: Nur Maizura (2001)

### **Monitoring/ Control AND Proper Planning/ Scheduling**

To begin with it is appropriate to refer to one of Kerzner’s sayings: “Failing to plan is planning to fail”.

Planning and controlling are closely related in the current research. In fact, some practitioners state that these functions cannot be separated. Without objectives and plans, control is not possible because performance has to be measured against some established criteria (Koontz, 2010).

Effective project management requires effective planning and control. Effective planning and control requires:

- The clear definition of the project;
- A robust approach to planning the project;
- Selection and use of the appropriate scheduling techniques;
- Rigorous monitoring that enables proactive control of the project;

- A sound basis for this is good record keeping, which also facilitates the virtuous feedback and learning cycle.

Monitoring and controlling includes controlling changes and recommending preventive action in anticipation of possible problems, monitoring the ongoing project activities against the project management plan and the project performance baseline, and influencing the factors that could circumvent integrated change control so only approved changes are implemented (Project Management Institute, Inc., 2013).

A project plan is fundamental to the success of any project (Kerzner, 2013). It is a formal, approved document that defines how the project is executed, monitored and controlled, and closed (Project Management Institute, Inc., 2013). The project plan serves as a guideline for the lifetime of the project and may be revised as often as needed. The project plan is a standard from which performance can be measured by the customer and the project team (Kerzner, 2013). All appropriate stakeholders should be involved when planning the project and developing the project management plan and other project documents (Project Management Institute, Inc., 2013).

The purpose of scheduling is to provide a ‘‘roadmap’’ that represents the delivery of the project scope over time as defined by the project team (Project Management Institute, Inc., 2013). Kerzner explains that a schedule is a plan showing when activities or accomplishments will be started and/or completed. The primary objective of scheduling is to coordinate activities to complete the project with the: best time, least cost and least risk (Kerzner, 2013).

Planning enables the project manager and their team to determine what methods and techniques they intend to use to deliver the required outputs, products and activities. Adding the activities to a schedule helps to understand the logical relationships between activities, the impact on resource distribution, the expenditure profile and reporting implications. In a well-planned project, the means of achieving the well-defined outputs, to an agreed standard, have been examined, thought about, optimised and recorded, and are regularly reviewed.

### **Clients Type/Size AND Qualification of Project Team**

This pair of success factors correlation coefficient is the highest one in current research that the Addis Ababa City Administration needs to prioritize in its housing development Program.

Teams and their constituents are clearly one of the critical success factors in a project. Symbiosis among team members is a must, but it does not necessarily mean that they need to agree on every point.

The size and make-up of project teams is determined by the Project client based on the size, complexity and type of the housing project.

Effective housing project management practices and project teams ensures housing projects are thoroughly reviewed from a delivery viewpoint, with specific focus on the project management plan and supporting project delivery documentation that the client high focus must be given in the process from planning to completion of the project.

Project Teams are an internal vehicle for the communication of pertinent and essential information relative to the development, implementation and ongoing activities of a project.

Client factors (construction regulations, product and service certification, standards, construction permits) are attributed to the meso environment. The meso environment is the setting between the macro and micro opportunities. It shapes the framework of a business or organisation and can be considered as its infrastructure: policies, standard operating procedures, rules and guidelines. It is a system of state and financial institutions, public authorities and institutions, which determines the volume of construction and building permit review. These factors have a huge influence on the success of construction projects.

Success in construction projects is dependent on the effective organization of multiple, specialized teams, each of which brings its own ability, experience, knowledge and skill towards completing the joint project, but which also bring their own objectives, goals and management styles, which may not be entirely complimentary (Chen, W., Chen, T., Lu, Ch. Sh., Liu, Sh.-Sh., 2012).

“The Chief Executive Officer and executive team view projects as core to delivering the organization’s strategy,” says Adrian McKnight, PMP, program director for the company’s strategic building blocks program (SBBP). “

(Butler 1970), aimed at courses for technicians, describes in broad terms the roles of client, architect, structural engineer, services engineer, quantity surveyor, clerk of works, local authority, building inspector, factory inspector, builder, sub-contractors, nominated sub-contractors, suppliers and nominated suppliers.

Housing Project management doesn't happen in a bubble. It must be a collaborative effort that extends to the contractors, vendors and clients working on a project, says Mr. Buisson. "Everyone we work with must subscribe to the quality, safety and value metrics we use to track projects."

Project owners are continually striving for a balance between power, responsibility and control. They have the power that comes from control over the budget, yet are ultimately responsible to their corporate Boards and Chief executive officers. They bear the responsibility for huge projects worth billions of dollars, along with the associated commercial and reputational costs of failure. Yet, project owners have to cede much of the project execution risk and control to industry experienced engineers and contractors. Managing these dynamics requires maturity. Maturity in planning and financial forecasting; maturity in hiring and developing the right talent; maturity in ongoing risk and project management; maturity in contingency management to cope with the inevitable setbacks that accompany major construction projects; and maturity to build positive and effective working relationships with contractors that bring out the best in all parties. **(Global construction survey, 2015).**

In order to successfully manage the enormous responsibility of a multi-billion-dollar project, clients are heavily dependent upon capable project management teams that understand engineering and construction, project management principles and practices and, not least, the increasingly sophisticated technology that controls every step. The talent gap is a much-discussed phenomenon in the industry, and owners face the same challenges that contractors have been grappling with for years – to attract, train and retain the best people in the face of severe competition from other sectors.

One of the organization's most pressing needs is: "making sure they have well trained project managers with good tools to complete projects on time and within budget."

The larger the organization, the more likely it is to have a significant pool of tried and tested project workers.

**Angela Gildea** Principal, KPMG in the US, argues that, the art of managing mega projects is declining, while the projects themselves are becoming ever more complex. With many organizations outsourcing increasing numbers of tasks to engineering and construction firms, the required skills of internal staff change from ‘executing’ projects to managing schedules and contractors. And all of this is happening at a time when many traditional owners are seeing graduates enticed by different, often better rewarded positions in new industries. Companies can reap great benefits by taking a fresh approach to talent management.

Research has found a distinct correlation between strong talent practices and greater shareholder return (2015 Global construction Project owner’s survey). For high performing companies, talent management is more than just a Human resource issue – it’s a strategic imperative and should therefore be closely aligned with wider business objectives and accountability shared across all levels of leadership. This means integrating talent considerations into the following areas:

*Business strategy:* to determine the people and processes to help achieve your goals

*Risk management:* ensuring availability of key resources and planning successors

*Investment and measurement:* measuring the return on investment in talent

*Governance and infrastructure:* ensuring clear ownership of talent management, with appropriate data and systems support. In this matters;

- *predictive modelling:* to more accurately forecast future people needs
- *retention algorithms:* to predict which employees are most likely to leave or retire
- *Valuing top performers:* calculating the (potentially significant) difference between average and exceptional employees, to justify recruitment strategies and acknowledge individual contributions.

### **Clear Objectives of Project AND Project Scope /Size**

Correlation coefficient of this pair of success factors in the current research is high that the housing project objectives are developed to help achieve goals by dividing them into manageable components of project scope. For example, “minimize housing shortage” would be a goal. A supporting objective could be “adopt a new housing development strategy that strive successful housing delivery.” This objective establishes a policy that encourages building a number of housing flats. Successful completion of multiple objectives is needed for each individual goal. Some objectives may themselves have components that can be expressed as "action steps," but it is vital to eventually identify in the plan all the details that will guide and encourage concrete

actions to be taken as per the stipulated project scope and size of the housing development program of the Addis Ababa City Government.

Clear objectives define strategies or implementation steps to attain the identified goals to the satisfaction of the project scope with its size. Objectives are specific, measurable, and have a defined completion date. They are more specific and outline the “who, what, when, where, and how” of reaching the goals. To this end the city government of Addis Ababa clearly set objective through its integrated housing development program (IHDP) in 2004 to address the acute housing problems in the city this was found to be a worthy exercise that was immediately scaled up to address the urban housing problem in the country. The development of the national IHDP in 2006 capitalized on the experiences of Addis Ababa city administration between 2004 and 2005 that had introduced new ways of delivering low cost affordable housing to urban residents (MoWUD, 2008).

It is estimated that about 20 per cent of the total population of Ethiopia currently lives in urban areas, which has rendered it as one of the least urbanized countries in sub-Saharan Africa. Despite this low level of urbanization, however, the country has one of the highest rates of urbanization even by the standards of developing countries, which is estimated at 4.1 per cent (MUDHC0, CSA, 2014). This is also much higher than the average growth rate of the total national population, which is estimated at 3 per cent per annum. The level of urbanization has been only 6 per cent in the 1960, which has increased to 11 per cent in 1984 and 14 per cent in 1994, which is estimated to have already reached 17.2 per cent by 2013 and projected to account for 30 per cent of the total population in the year 2025 (Ibid,2014).

Plans and actions based on clear goals and objectives are more likely to succeed in meeting the community’s needs by maximizing the project size in different approaches to solve the critical housing shortage in the Addis Ababa City by providing the full extent of the planning and delivery period. So, wherever the information was available, the data collected on each of the housing project sites covers the stages associated with the total lead-in time of the development (including the process of securing a development plan allocation), the total planning approval period, starting works on site, delivery of the first dwelling and the annualised build rates recorded for the development up until to the latest year where data is available 2018/19 sets out the stages and the milestones used to measure them. This is highly correlates the project objectives and the project size in the housing development schemes.

#### **4.4.2. Summary of Success Factors Interrelation**

The findings of this section both support some theories already expressed by different authors as well as highlight some new trends, which could be considered while executing housing construction projects in Addis Ababa.

This part of research answers the research question of success factor interrelationship. Moreover, it provides us with valuable information that might add knowledge to the analysis success factor importance as well.

These findings support the theory that different drivers of project success do not exist in isolation from each other. It is likely that while directly influencing the project success some factors are influencing other parameters as well. Seven groups of success factors appear to be highly correlated among themselves supported by another fifteen groups with a moderate strength of association that might be practically interpreted.

Therefore, it might be concluded that there are a lot of interrelationship between the dependent variable of project success and independent variables of success factors exist.

Dominance of Project management related success factors in the interrelation map supports the findings of the previous section of this research regarding the importance of this group and the recent study at the London School of Economics (LSE) in UK that reported the management practice in Africa is poor as compared to Europe and North America. According to this report, Ethiopia is the second from the last followed by Mozambique which indicates that the management practice in Ethiopia is even far behind from those poor performing developing countries in Africa. With this driving fact, the research assessed the performance of Ethiopian construction industry with respect to construction project management practices and its challenges in order to identify the major issues for intervention. The results revealed that the level of construction project management practice in terms of adapting general project management procedures, project management functions, tools & techniques to be unsatisfactory. Particularly, the level of practice in terms of safety, risk and time management was found to be very low. The amount of schedule slippage ranges between 61-80% and that of planed costs and other variables such as risk, quality, resources utilization and safety deviates in the range 21-40% from predetermined requirements or anticipated at the beginning of the project. (Tadesse .A, Zakaria .D, Zoubeir .L,2016)

Overall if analyzing the interrelation map from the group of factors perspective it clearly shows the dramatic dominance of factors related to the primary project success area. This finding supported in the interrelation map that Human related factor, and General management and organization factors importance of this group.

## **CHAPTER FIVE**

### **SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMENDATIONS**

#### **5.1 Summary of Major Findings**

The main goal of this project research was to identify a list of success factors significant in housing construction projects and to investigate possible interrelations between success factors in housing construction projects in Addis Ababa. Thus in this regard this research result has found the following major findings.

A questionnaire based survey investigated the main drivers of housing construction project success in Addis Ababa and found some strongly and moderately interrelated success factors. Theoretical framework developed from existing project management literature in the success factors area served as a basis for data collection. Based on 26 responses obtained both the research questions have been answered.

#### **Research question 1:**

*Identification of significance of success factors for housing construction industry in Addis Ababa.*

This question was addressed by a special evaluation question in the questionnaire supported by different background questions which helped to analyze the situation from different perspectives.

Since the category of project success is ambiguously defined by itself (Cox *et al.*, 2003) the research addresses factors evaluation in terms of project management success (time, cost and quality) as well as project success (stakeholders satisfaction, meeting project objectives, profitability). These parameters represent the most widespread characteristics of project success (Chua *et al.*, 1999; Chan and Kumaraswamy, 2002; De Wit, 1988).

Therefore, the general analysis of significance of groups of success factors was broadening with detailed investigation of importance of the same groups but for different interpretation of project success. In addition, the findings were examined on their dependence on such sample characteristics as relevant work experience to identify possible additional trends.

Data analysis indicated a quite strong division of groups of success factors into two areas:

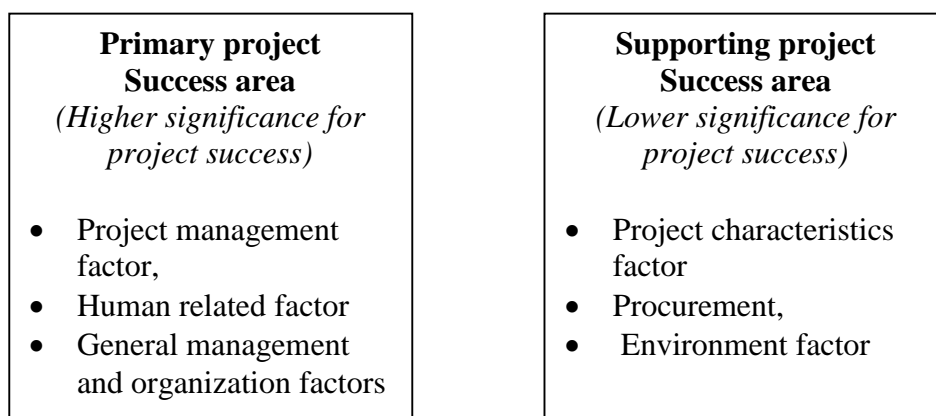


Figure 19 Primary and Supporting Project Success area

Based on the analysis of the significance of each group for overall project success the study shifts its focus to primary project success area and single factors which form these groups and on their impact on project success. A ranking table reflects the list of success factors relevant for Addis Ababa housing construction industry according to their impact presented in an ascending order.

## Primary Project Success Area

*(In the prior focus in the group)*

### **Project management:**

- 1) Proper Planning/ Scheduling
- 2) Communication
- 3) Monitoring/ Control
- 4) Decision Making Abilities

### **Related to people:**

- 1) Project Manager's Competence/Leadership
- 2) Project Manager's Authority
- 3) Qualification of Project Team
- 4) Team Spirit Between Project Key Players
- 5) Contractors' Competence
- 6) Project Manager's Experience
- 7) Client's Type, Size
- 8) Client's Knowledge and Experience
- 9) Relations with Sponsor/ Project Champion
- 10) User Involvement

Moreover, combination of findings regarding groups of factors with single factor analysis might be combined in a general framework (Figure, 20). This framework completely answers the first research question and might be used as a roadmap for achieving project success in housing construction projects in Addis Ababa.

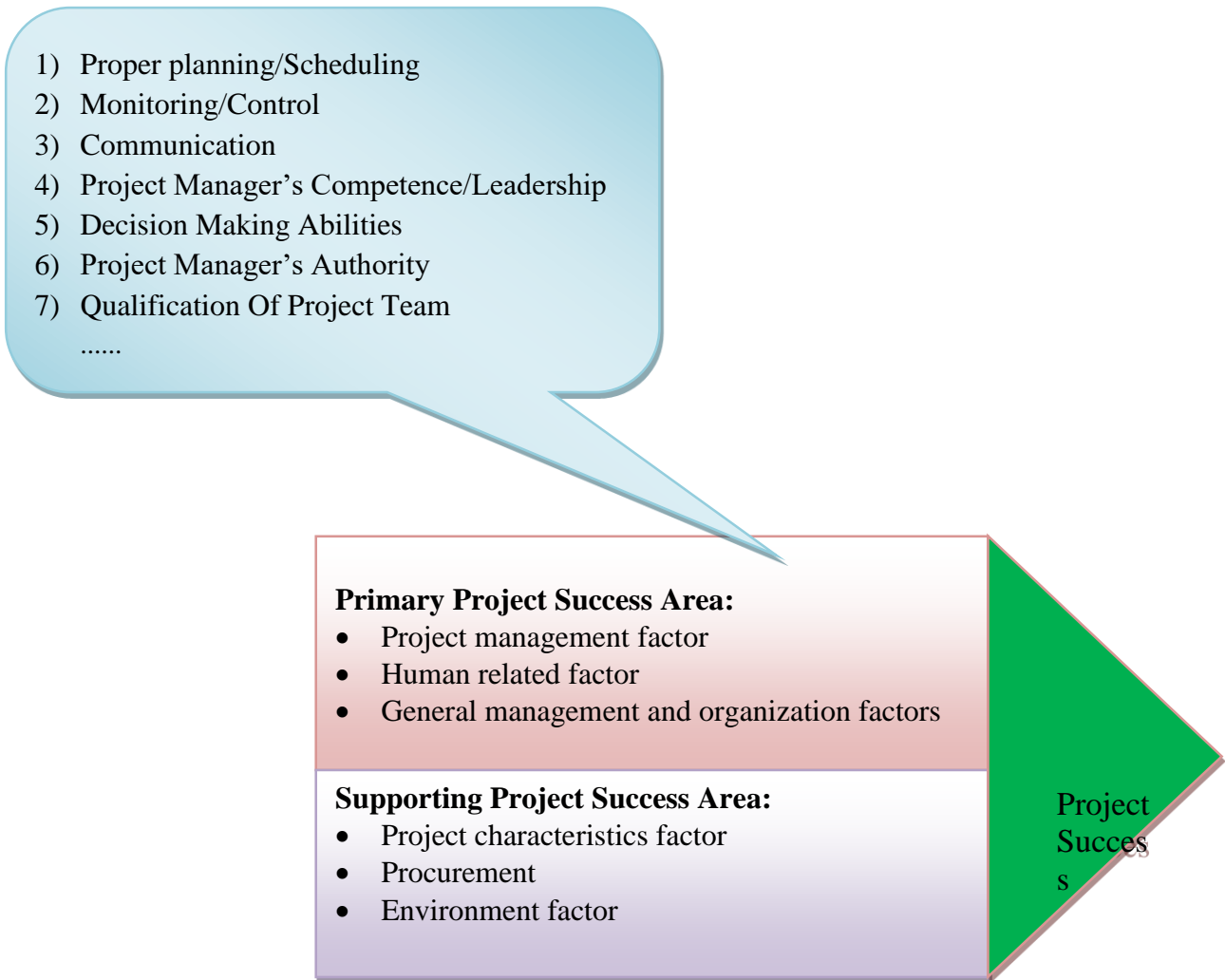


Figure 20 Framework of success factors significance

**Research question 2:**

*Identification of possible interrelations between success factors in housing construction projects in Addis Ababa.*

Research approach to this question was based on analysis of correlation between impacts of every factor on project performance. Findings clearly indicated existence of numerous interconnections both between factors related to one group and factors related to different groups.

The following groups of factors appeared to have a high strength of association:

- 1) Communication and Monitoring /Controlling
- 2) Project Scope /Size and Importance of the Project
- 3) User Involvement and Relations with Sponsor/Project Champion
- 4) Project Manager's Authority and Project Manager's Experience
- 5) Monitoring Control and Proper Planning/ Scheduling
- 6) Clients Type/Size and Qualification of Project Team
- 7) Clear Objectives of Project and Project Scope /Size

It might be a clear indicator for management that changes in one of the parameter is likely to influence the other one as well.

These findings were extended by moderately influenced other drivers of project success. 41 different pairs of factors were considered being statistically and practically relevant. The following factors had the highest number of moderate correlation with other parameters:

1. Clear Objectives of Project and Importance of the Project
2. Communication and Proper Planning/Scheduling
3. Decision Making Abilities and Proper Planning/Scheduling
4. Decision Making Abilities and Monitoring Control
5. Decision Making Abilities and Communication
6. Project Manager's Experience and Project Manager's Competence/Leadership
7. Project Manager's Authority and Project Manager's Competence/Leadership
8. Qualification of Project Team and Project Manager's Authority

Analysis and discussion of these data helped to answer the second research question by clearly indicated the interrelations between different success factors. It might be concluded that success drivers do not influence just the dependent variable of project success. Moreover, while contributing to project performance they influence other input parameters as well.

In addition, interrelation map support the findings of previous section related to significance of success factors. It appeared that majority of factors that have high or moderate correlation coefficient belongs to the primary group of success factors (Table, 11). This is a clear indicator of a higher importance of these factors comparing to others. Having a significant impact on overall project success these factors have an influence on other factors as well. Therefore, the importance of each factor will grow with the amount of interrelations it has.

Type of success factor area	Amount of strong and moderate Interrelations
Primary area	22
Supporting area	6

*Table 11 Interrelation spread between success factor areas*

## 5.2. Conclusions

These findings might be taken for consideration when allocating limited resources for personal training and development. Among all the listed factors the impact of Project Manager’s Competence, Leadership, Authority; Qualification of Project Team; Team Spirit Between Project Key Players are the highest on future project performance both from time, cost and quality perspectives and stakeholders’ satisfaction. Training of personal in these areas might significantly improve the overall quality of project execution.

Generally, the project manager is appointed to serve client needs in managing the project as a whole and leading the project team to achieve the client’s objective A project manager that well versed in the project management process can play an important role coordinating in providing the necessary link between the client and the project team, eliminating the dispute, enhancing team productivity and synergy. Project managers in housing construction industry are responsible for the overall success of delivering the housing development within the constraints of cost, schedule, quality and safety requirements.

High weight skills in project success is also supported by the fact that human factors in key project parties have been found influential factor in Contractors' Competence, Client's Knowledge and Experience, User Involvement appeared to be other drivers of performance identified by the study.

Another application of the study beside the identification of the most important success factors is performance of interrelation analysis between them. By doing so researchers concluded that improving of some characteristics of project manager or project team is very likely to influence some other success factors as well. Therefore, this research helps to identify those factors which have a significant relationship with others and therefore deserve a bigger attention from the managers.

These findings might considerably increase the effectiveness of improvement process which might be necessary to increase the probability of project success. Using this study as a guide might indicate which factors will be affected while improving some of the key parameters. In addition, it can reduce the overall cost of the improvement process by serving as a map of change diffusion.

This research first in its area has tried to identify the influential success factors in the Addis Ababa City Government housing development endeavours. Further, the research has provided benchmark data on the current status of housing development practice in the construction industry for use in continuous assessment of future improvement efforts. Moreover, the research has proposed primary and supporting success factors that could be used to frame housing industry improvement efforts and assess importance of project management knowledge and human resource development for the industry. Nevertheless, this thesis research is meant only a starting work towards a long journey to the critical success factors that highly and moderately interrelated in the development of housing industry of the city of Addis Ababa as part of the construction industry specifically. The main goal was to do a starting work and open the door for further refinement and investigation and demonstrate the application of the concepts raised. The research presumed that future works will address the rest and the details.

The last but not least that the city government of Addis Ababa needs to introduce the following major inputs in its housing development program for sustainable and effective endeavours;

⇒ Investment on Institutional setup and capacity building program

- ⇒ Draft and enforce housing regulation and policy
- ⇒ Project management policy
  - The purpose of this policy is to ensure that there is common and consistent application of housing project management principles and practise across the city including standard operating procedures, rules and guidelines.
- ⇒ Initiate and implement Competency Standard for Project Management, which can be adopted as part of qualification system by benchmarking international practices for the housing development industry
- ⇒ Establish and enforce a transparent system of checks and balances in urban planning and implementation.
- ⇒ Existing cadastre and land-use should be documented in a transparent and effective land registry.
- ⇒ The community must be involved at greater extent, both to identify intervention activities, but also in funding.
- ⇒ The capacity of institutions in charge of land preparation and housing needs to be strengthened.
- ⇒ Responsible city's housing development institution needs to cooperate with international best practice sister cities in the housing development industry for skill, knowledge and technology transfer partnership.

### **5.3. Recommendations**

The findings and conclusions of current study highlight a number of important issues related to housing construction industry in Addis Ababa. This information might be of particular interest both for the Addis Ababa city government which already operate in housing development since 2004 and for those who plan to expand their activities to it. Some of the most interesting moments related to practical implications will be described below.

Since projects can be successfully completed only with a focused attention on goals by the project team members, projects act as a means for consolidating the experience and expertise of the organizational members effectively, create a learning environment, encourage-team spirit and help to achieve organizational objectives. As the current research output revealed and witnessed that Proper Planning, Scheduling, Monitoring, Controlling, Communication, Decision

Making Abilities were considered as the most important group of factors for achieving project success in housing construction industry in Addis Ababa.

With these findings importance of effective project management which would seem to be the most important for the Addis Ababa City Government housing development program needs in solving its critical problems;

- ✓ The housing industry plays a vital role in attaining the goal of city's sustainable development. At large contributes immensely to national growth, forms part of the productive economic sector and actively contributes to the gross domestic product (GDP) of Ethiopia.
- ✓ It is identified as one of the most critical priorities of the city's program to solve housing shortage and job creation opportunities.
- ✓ It is a way of getting experienced people to work together to achieve the program goals.
- ✓ It is a way of efficiently using scarce resources such as land and budget. Effective utilization of scarce skilled personnel, as well as raw materials and expensive equipment which is imported by foreign currency is extremely important in the development.
- ✓ It is a way of developing housing faster and more efficiently (usually cheaper).
- ✓ It is a way of increasing the probability of completing the housing project on time and within budget.
- ✓ It is a way of increasing the efficiency and effectiveness of government bureaucracies. It can cause some other agencies to learn some lessons from the implementation of the projects, and possibly incorporate some of the techniques into their system.
- ✓ Completing the projects on time and within budget (fulfilling the promises) will give people more trust and confidence in the city government, and will encourage the system to be more responsive to public needs and expectations.

#### **5.4. Recommendations for Further Study**

This research work is a starting one and needs be followed by a number of researches to investigate scopes which are not considered in this research and to refine the concepts raised and further enhance our understanding, and contribute to the construction project management knowledge pool. Thus research recommends the following for further research and investigation:

- Conduct research by increasing the sample size and studying the area more in depth by deploying different methodology at country level

- Conducting in-depth research to determine in detail how each of the success factor group knowledge area is being performed by the contractors so as to be able to prepare a detailed improvement framework possibly using case study approach to get a deeper insight.
- Conduct further research to refine the success factors and the assessment questionnaire through active involvement of academicians and professionals using focus group and further extensive literatures review

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# Annexes

## Appendix 1: Coding of the Research model

### Appendix 2: Semi-structured interviews question guide

Code	Description	Description
<b>X1....</b>		<b>Success factors related to project characteristics:</b>
X11		
X12		Type of the project
X13....		Project scope/size
		Clear objectives of projects
<b>X2....</b>		<b>Success factors related to project management:</b>
X21		
X22		Proper planning/scheduling
X23....		Monitoring/control
X24....		communication
		Decision making abilities
<b>X3....</b>		<b>Success factors related to people:</b>
X31		PM's competence/leadership
X32		PM's experience
X33....		PM's authority
X34....		qualification of project team
X35....		client's type, size
X36....		client's knowledge and experience
X37....		contractor's competence
X38....		relations with sponsor/project champion
X39....		user involvement
X10....		team spirit between project key players
<b>X4....</b>		<b>Success factors related to general management and organization:</b>
X41		top management support
X42		change management
X43....		organizational structure
<b>X5....</b>		<b>Success factors related to procurement:</b>
X51		purchasing
X52		tendering
<b>X6....</b>		<b>Success factors related to environment:</b>
X61		Social environment
X62		Political environment
X63....		Economic environment
X64....		Technical and technological environment
<b>Y</b>		<b>Project Success</b>

**1. Questions about interviewee:**

- a. What is your current position in the company?
- b. What is your role in projects?
- c. In which type of projects you were working before?
- d. Who is the main client in your company?

**2. Questions about success in projects:**

- a) Please describe your last project (type).
- b) What in your opinion make project successful?
- c) Was your last project successful (considering time, budget, quality requirements, stakeholder satisfaction and project purpose)?
- d) Do you have a real example of successful project in your experience? Please describe it.

**3. Questions about groups of success factors and their influence on project success:**

- a) Do you think project characteristics are important for housing construction project success? Please specify which and why.
- b) Do you think factors related to project management are important for housing construction project success? Please specify which and why.
- c) Do you think human factor is important for housing construction project success? Please specify which and why.
- d) Do you think general/corporate management is important for housing construction project success? Please specify which and why.
- e) Do you think procurement is important for housing construction project success? Please specify which and why.
- f) Do you think environment characteristics are important for housing construction project success? Please specify which and why.

**4. Please comment about understanding and interpretation of the questionnaire.**

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## Appendix 3: Questionnaire design

### a) Summary of Cover Letter

Dear Respondent,

We request your participation and support our research on “Success Factors in Construction Projects in Addis Ababa” undertaken as a part of Master Thesis at School of Commerce ,Addis Ababa University.

The focus of current research is on success factors of mass housing construction industry in Addis Ababa. The aim of this questionnaire is to identify the most important levers which influence housing construction project success in Addis Ababa. This research is being conducted as a part of requirement for completion a Master Course in Project Management. Your input as experienced professional in area of construction project management is highly appreciated.

Eleven questions of this survey should not take more than 15 minutes to be completed and mainly address information about your company and last project you were involved in. There are no right or wrong answers to the questions since your opinion is of primary important.

There is no risk associated with filling in the questionnaire since anonymity of the answers is guaranteed by researchers.

We hope you will be able to find 15 minutes to complete this questionnaire in your schedule. At the end of the electronic form just click the submit button. Regardless of whether you choose to participate, please let us know if you would like a summary of our research.

Thank you for your time and concern.

Sincerely Yours,

### B Summary of Questionnaire Design

#### **i.Please, provide information about yourself and your company’s background**

1. The title of my current job position is: \_\_\_\_\_
2. How successful was your last project comparing to other projects in your company in terms of:

*Please rank according to the scale*

*1 –unsuccessful, 2- slightly successful, 3-moderately successful, 4- very successful and 5 - extremely successful*

Time required for project completion	1	2	3	4	5
Delivering the project within budget	1	2	3	4	5
Delivering the project quality requirements	1	2	3	4	5
Achieving stakeholders' satisfaction	1	2	3	4	5
Achieving project purpose	1	2	3	4	5

3. How profitable was your last project comparing to others (similar type) in the company:

*1- much worth 2- somewhat worse 3- stayed the same 4- somewhat better 5- much better*

4. What was the budget of your last project (in birr)\_\_\_\_\_

For the following section please select the most appropriate:

5. My work experience in construction projects field (managerial position) is:

- a. Less than 2 years
- b. 2-4 years
- c. 5-7 years
- d. More than 8 years

6. My company's scope of operations:

- a. World wide
- b. Addis Ababa wide
- c. different regions of Ethiopia

7. My company's size in terms of number of employees (including subcontractors):

- a. less than 100
- b. 100-500
- c. 500-1500
- d. 1500-3000

8. The main clients of my last project was:

- a. government
- b. commercial/business
- c. both
- d. other (please specify): \_\_\_\_\_

9. The type of my last projects was:

- a. housing construction
- b. Civil engineering construction (bridges, roads, etc.)
- c. Industrial construction (plants, refineries, etc.)
- d. other types of projects

**ii. For the following section please provide your opinion about the success factors of the projects you were managing recently.**

1) Please briefly tell us what in your understanding makes project successful

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2) Please briefly describe a project which was a success in your organization

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3) For the following question please grade each factor basing on its **impact** on your **last project** success. Assign grades according to following scale:

1 –not at all important, 2 – unimportant, 3 – neutral, 4 – important and 5 – very important.

Factors leading to project success	1	2	3	4	5
<b>success factors related to project characteristics:</b> - importance of the project - project scope/ size - clear objectives of project					
<b>success factors related to project management:</b> - proper planning/ scheduling - monitoring/ control - communication					

- decision making abilities					
<b>success factors related to people:</b> - PM's competence/leadership - PM's experience - PM's authority - qualification of project team - client's type, size - client's knowledge and experience - contractors' competence - relations with sponsor/ project champion - user involvement - team spirit between project key players					
<b>success factors related to general management and organization</b> - top management support - change management - organizational structure					
<b>success factors related to procurement:</b> - purchasing - tendering					
<b>success factors related to environment:</b> - social environment - political environment - economic environment - technical and technological environment					
Any success factor not mentioned above which you consider important: _____					

If you have any comments regarding the table please feel free to mention them here:

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- 4) Please evaluate the percentage of contribution (X%) of the mentioned above group of success factors to 100% project success:

<b>Groups of success factors</b>	<b>Contribution to project success</b>
Success factors related to project characteristics	
Success factors related to project management	
Success factors related to people	
Success factors related to general management and organization	
Success factors related to procurement	
Success factors related to environment	
<b>Total</b>	<b>100%</b>

- 5) Would you like a summary of this study to be sent to you after it will be completed:
- a. Yes (please provide your e-mail\_\_\_\_\_)
  - b. No

Appendix 4: Data collected by questionnaire (responses spreadsheet)

Code of respondent	position	project time	project budget	project quality	stakeholders satisfaction	project purpose	profitable	last project amount	work experience	operation location	number of employees	client	last project type
1	site supervisor	1	2	4	3	3	2	14,000,000.00	b	c	a	b	a
2	resident engineer	3	5	4	5	5	4		d	b	a	a	a
3	project manager	4	4	5	4	4	4	50,000,000.00	d	c	b	c	a
4	assistant project manager	3	4	3	3	3	4		b	c	c	b	a
5	project manager	2	1	4	4	4	1	86,782,317.78	c	c	b	a	a
6	project manager	4	4	4	3	4	5	65,000,000.00	c	c	b	c	c
7		1	1	2	2	1	1		d	a	d	a	a
8	project manager	4	3	4	4	4	4	112,000,000.00	c	c	b	c	a

9	project manager	3	4	4	4	3	4	800,000,000.00	b	c	c	b	a
10	general manager	3	3	3	3	3	4	106,000,000.00	d	c	b	c	a
11	branch manager	3	4	4	4	4	4		d	b	b	a	d
12	resident engineer	1	1	1	2	1	1		d	c	b	c	a
13	resident engineer	5	4	4	3	4	5	100,000,000.00	b	c	c	a	b
14	office engineer	4	5	3	4	4	4	86,000,000.00	b	b	a	b	a
15	site supervisor	2	3	3	3	2	4	90,000,000.00	b	b	b	a	a
16	site supervisor	3	3	4	3	4	4	300,000,000.00	b	c	b	a	a
17	site supervisor	2	1	3	2	3	4		c	c	b	a	a
18	deputy manager	5	4	4	4	5	5	1,800,000,000.00	d	a	d	a	a
19	p/coordinator	1	3	2	2	1	1	108,000,000.00	d	c	b	a	a

20	site supervisor	2	2	3	2	1	2		b	c	b	a	b
21	project engineer	3	2	4	3	5	4	11,000,000.00	b	c	b	c	b
22	contract admin	2	1	2	1	1	3		b	b	c	a	a
23	project manager	1	2	3	1	2	2	80,000,000.00	d	c	b	a	d
24	project manager	1	3	4	1	1	2	1,400,000,000.00	d	a	b	c	d
25	site supervisor	3	2	4	3	4	3	108,000,000.00	c	c	b	a	a
26	site supervisor	1	2	3	1	2	3	33,297,971.52	b	c	b	a	a
27	project manager	3	2	4	3	4	2		d	c	c	a	a
28	office engineer	4	3	4	3	4	4	49,000,000.00	b	c	c	c	a
29	office engineer	3	3	3	3	3	4		a	c	d	a	a
30	project manager	2	1	2	1	3	4	13,000,000.00	d	c	a	c	a
31	site supervisor	2	2	3	2	2	3	141,020,163.36	c	c	b	a	a

32	site supervisor	2	1	3	3	2	2	800,000.00	b	c	c	a	a
33	project manager	2	2	3	3	3	3	91,993,352.00	c	c	b	a	a
34	project manager	3	3	4	4	4	3	90,000,000.00	d	c	b	a	a
35	project manager	3	4	4	5	4	3	108,000,000.00	c	c	c	a	a
36	project manager	4	4	3	4	3	3	1,500,000.00	d	c	d	c	a
37	deputy manager	1	1	1	1	1	1		a	b	d	a	a
38	project manager	1	4	2	1	1	2	100,053,666.67	d	c	b	a	a
39	project manager	3	3	4	4	3	4	60,000,000.00	b	c	a	a	a
40	project manager	4	4	4	4	4	5	100,000,000.00	b	c	c	b	a
41	project manager	4	4	5	5	5	4		d	c	c	a	b
42	project manager	3	2	4	2	2	4	50,000,000.00	c	c	d	a	d
43		2	1	3	1	1	4	604,802,217.00	d	c	a	a	d

44	project manager	3	2		4		4	86,000,000.00	c	c	a	a	a
45	project coordinator	2	3	4	1	3	5	1,068,240,989.44	d	c	b	c	a
46	site inspector	1	1	1	1	1	3	1,800,000,000.00	b	c	b	a	a
47	site engineer	2	2	2	3	2		24,000,000.00	d	c	b	a	a
48	site inspector	3	4	5	4	5		49,500,000.00	c	c	a	b	a
49	project coordinator	1	4	3	3	3	5	202,000,000.00	d	c	b	a	b
50	project manager	1	2	3	3	3	1	56,460,200.00	d	c	a	a	a
51	site engineer	1	3	3	4	3	2	12,000,000.00	d	c	c	c	a
52	site engineer	3	3	3	2	3	4	12,000,000.00	a	c	a	a	a
53	resident engineer	1	3	2	1	3	3		b	c	a	a	a
54	resident engineer	1	2	2	1	1	3		b	b	a	a	a

55	construction supervision and quality control	2	3	3	1	3	5		a	b	d	c	a
56	contract admin	1	2	4	1	1	4	28,467,269.53	b	b	d	a	a
57	site supervisor and quality control	3	3	4	2	4		24,811,078.61	a	b	c	a	a
58	construction supervision and quality control	1	22	3	1	1	3		b	b		a	a
59	general supervisor	1	3	3	1	2	4	10,000,000,000.00	b	b	d	a	a
60	construction supervision and quality control	2	3	3	2	2	3		a	b	b	a	a

61	branch deputy manager	1	3	4	3	2		15,000,000,000.0 0	d	c	d	c	a
62	vice manager	3	4	4	3	3	5	15,000,000,000.0 0	d	c	c	d	b
63	building supervisor	3	3	3	2	3	4			b	c	c	a
64	site engineer	3	3	4	3	5	4		d	b	a	a	d
65	resident engineer	3	3	4	3	4			c	c	b	a	a
66	site inspector	3	4	4	3	4	4		b	a	b	a	a
67	supervisor	3	4	4	3	3	4	368,000,000.00	b	b	b	a	a
68	supervisor	1	1	5	4	5	2	90,000,000.00	c	c	c	c	a
69	site supervisor	1	1	2	3	1	4		b	c	b	a	a
70	site supervisor	2	2	3	3	3			b	b	b	a	a
71	structure engineer	3	1	5	3	4	3	700,000,000.00	c	c	a	b	a

importance of the project	project scope/size	clear objectives of project	proper planning/scheduling	monitoring/control	communication	decision making abilities	PM's competence/leadership	PM's experience	PM's authority	qualification of project team	client's type, size	client's knowledge and	contractors' competence	relations with sponsor/project	user involvement	team spirit between project key	top management support	change management	organizational structure	purchasing	tendering	social environment	political environment	economic environment	technical and technological
4	3	4	4	4	3	4	4	3	3	4	3	3	4	3	3	4	3	4	4	3	4	3	3	4	3
4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
4	4	4	3	3	3	3	4	4	4	3	4	3	3	4	2	2	5	4	5	5	5	3	3	4	4

3	3	5	5	5	5	5	5	3	3	3	3	4	4	4	5	5	5	3	5	4	5	5	5	5	5
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5
3	3	3	4	4	4	4	2	2	2	5	5	5	5	5	5	5	3	3	3	1	1	1	1	1	1
4	4	4	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	5	5	5	4	5	4	5	3	4	4	4	4	4	4	4	4	4	4	4
4	4	4	5	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5	5	5	4	4	4	5
4	3	4	5	5	5	5	4	4	4	5	4	4	5	3	2	5	4	4	4	5	5	4	5	5	4
5	5	5	5	5	5	5	4	4	4	4	5	5	5	5	5	5	5	3	5	5	5	5	5	5	5
4	4	4	5	4	5	3	4	5	4	5	5	5	5	4	5	5	5	4	4	4	4	4	5	4	4
4	4	4	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	5	5
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Moderately

Highly

	Importance Of The Project	Project Scope /Size	Clear Objectives Of Project	Proper Planning/Scheduling	Monitoring Control	Communication	Decision Making Abilities	Pm's Competence/Leadership	Pm's Experience	Pm's Authority	Qualification Of Project Team	Clients Type/Size	Clients Knowledge And Experience	Contractor's Competence	Relations With Sponsor/Project Champion	User Involvement	Team Spirit Between Project Key Players	Top Management Support
Importance of The Project	1																	
Project Scope /Size	.833**	1																
Clear Objectives of Project	.647**	.711**	1															
Proper Planning/Scheduling	.152	.249*	.432**	1														
Monitoring Control	.259*	.199	.177	.724**	1													
Communication	.179	.207	.173	.621**	.888**	1												
Decision Making Abilities	.165	.198	.283*	.661**	.656**	.633**	1											
PM's Competence /Leadership	.344**	.289*	.267*	.156	.239*	.263*	.254*	1										
PM's Experience	.244*	.257*	.050	.074	.193	.335**	.132	.696**	1									
PM's Authority	.353**	.367**	.164	.085	.244*	.266*	.028	.696**	.811**	1								
Qualification Of Project Team	.248*	.248*	.055	.070	.231	.290*	.096	.521**	.493**	.612**	1							
Clients Type/Size	.270*	.316**	.034	-.030	.089	.115	-.042	.293*	.437**	.563**	.714**	1						
Clients Knowledge And Experience	.084	.136	-.030	.006	.170	.291*	.003	.270*	.664**	.556**	.492**	.596**	1					
Contractor's Competence	.208	.117	.069	.075	.205	.224	.145	.356**	.479**	.312**	.529**	.544**	.518**	1				
Relations With Sponsor/Project Champion	.340**	.418**	.251*	-.005	.234	.332**	.042	.367**	.419**	.450**	.584**	.543**	.543**	.397**	1			
User Involvement	.252*	.382**	.242*	.054	.166	.267*	.016	.319**	.307**	.418**	.559**	.560**	.416**	.436**	.818**	1		
Team Spirit Between Project Key Players	.376**	.288*	.217	.224	.415**	.412**	.157	.363**	.344**	.452**	.591**	.450**	.490**	.509**	.592**	.598**	1	
Top Management Support	.313**	.254*	.148	.166	.254*	.261*	.185	.322**	.259*	.284*	.144	.190	.073	.078	.062	.052	.235	1