Success Factors in Construction Projects: A Study of Housing Projects in Ukraine.
Acknowledgments

This Master Thesis was created not just based on the authors’ inputs but also due to commitment and support of several people and organizations. Therefore, we would like to sincerely thank them for their contribution to our research.

First of all, we are grateful to our thesis supervisor, Professor Tomas Blomquist. His competence both in the area of construction projects and academic research were extremely helpful for us. His valuable and precise feedback combined with strong support and encouragement guided us throughout the process of thesis writing and contributed significantly to its success. Many times his inputs helped us to focus the topic and increase the quality of final report.

Secondly, we would like to thank all the lecturers and administrative staff of Heriot-Watt University, MIP, Politecnico di Milano and USBE, Umea University who developed our knowledge and competences throughout the study period. It was a spacious experience which changed our lives.

Thirdly, we would like to show appreciation to Professor Müller whose additional lecture helped to develop the methodology of this research and Professor Mosconi who thought us the data analysis techniques we used in this study.

Thankfulness to all the project managers who participated in the research and found time in their busy schedules to answer our questions. Their commitment and quick responses contributed to the research development and made it possible within the time frame provided.

Finally, we convey our deep gratitude to European Parliament and European Commission. Mainly due to their support via the Erasmus Mundus scheme it became possible for us to complete the Master course.

Without the support of these people this Master Thesis could not be completed.
Abstract

Broadly discussed in the literature the concept of project success still remains ambiguously defined. The well known success criteria like time, cost and quality does not provide any practical information of achieving of project objectives in an efficient way. Identification of main drivers of project success gain particular importance for companies in the light of highly competitive environment.

Housing construction projects represent one of the largest sector in construction industry and Ukrainian housing construction industry is considered to have one of the highest rate of return in EU. However the amount of research related to Ukrainian market is limited to few general economy overviews published by such organizations like World Bank and big consulting firms.

The main aim of this research is identification of the most influential success factors from the 26 factors identified in existing project management literature. The analysis was performed in a highly profitable housing construction industry with a focus on Ukrainian market peculiarities.

A questionnaire survey was sent to 110 experienced housing construction project managers and 26 responses there received. Based on the findings of the questionnaire success factors were ranked according to their impact on project success. In addition success factors interrelationship was studied in order to study the importance of each factor in depth.

The findings of the research contributed both to project management field of study and Ukrainian construction market research. A primary and support areas of success factors were identified which might serve as a practical guide for managing housing construction projects in Ukraine. The most important success factors were defined: economic environment, project manager’s experience and qualification of project team.

Project managers in housing construction industry in Ukraine would probably consider being more aware of the dominance of environment and human resources related success factors. Additionally, success factors interrelation matrix might be used as a success diffusion map.

Further research might be also essential in this area like studying different types of project and expanding the focus of current study or analysing the importance of success factors on different stages of the project life cycle.

Key words: Housing construction, success factors, success factors interrelation, project management, Ukraine.
# Table of Contents

Acknowledgments ........................................................................................................ ii

Abstract ....................................................................................................................... iii

Table of Contents ......................................................................................................... iv

List of Tables and Figures ............................................................................................. vi

Table of Abbreviations ................................................................................................ vii

1. Introduction ............................................................................................................. 8
   1.1. Background ........................................................................................................ 8
   1.2. Scope of the research ....................................................................................... 9
   1.3. Structure of study .......................................................................................... 10

2. Literature review .................................................................................................... 11
   2.1. Construction projects. Housing Construction industry in Ukraine .................. 11
   2.2. Conceptual fundamentals ............................................................................. 14
   2.3. Project success factors. Theory perspective ............................................... 17
   2.4. Criticism of success factors ......................................................................... 28
   2.5. Project success factors. Practitioners’ perspective ...................................... 29
   2.6. Literature Review Findings ........................................................................... 30

3. Research methodology ........................................................................................... 33
   3.1. Research philosophy ..................................................................................... 34
   3.2. Research approach ....................................................................................... 34
   3.3. Research strategy ........................................................................................ 35
       3.3.1. Qualitative and quantitative approaches to the research .................. 36
       3.3.2. Type of research strategy ................................................................. 36
   3.4. Research design ........................................................................................... 37
   3.5. Time horizon ................................................................................................ 37
   3.6. Data collection techniques .......................................................................... 37
       3.6.1. Semi-structured interviews: Pre-study ........................................... 38
           Interview questions design ................................................................. 38
           Interview procedure .............................................................................. 39
       3.6.2. Self-completion mail questionnaire: Main Study ............................... 40
           Sample accuracy ...................................................................................... 40
           Sample precision ..................................................................................... 41
           Sample size ............................................................................................. 42
           Questionnaire design ............................................................................. 43
           Questionnaire analysis .......................................................................... 44
           Questionnaire procedure ..................................................................... 45
   3.7. Limitations of the research methodology .................................................. 45
3.8. Research ethics ........................................................................................................... 46

4. Findings and Discussion .............................................................................................................. 47

4.1. Research flow and sample description .............................................................................. 47

4.2. Groups of factors discussion ................................................................................................. 50
  4.2.1. Groups of success factors overview ............................................................................... 50
  4.2.2. Groups of success factors analysis ............................................................................... 51
  4.2.3. Summary for Groups of factors discussion ...................................................................... 56

4.3. Success factors discussion ..................................................................................................... 57
  4.3.1. Success factors overview ............................................................................................... 57
  4.3.2. Success factors belonging to the project management group .......................................... 59
  4.3.3. Success factors belonging to human group ....................................................................... 60
  4.3.4. Success factors belonging to environmental group ........................................................ 61
  4.3.5. Summary of success factors analysis .............................................................................. 62

4.4. Success factors interrelationship ......................................................................................... 63
  4.4.1. Analysis of highly correlated success factors ................................................................. 64
  4.4.2. Analysis of moderately correlated success factors ........................................................ 66
  4.4.3. Success factors which appeared to have insignificant correlation .................................. 70
  4.4.4. Summary of success factors interrelation ....................................................................... 70

5. Conclusions and managerial implications .............................................................................. 72

5.1. Summary of the findings ....................................................................................................... 72

5.2. Managerial implications ....................................................................................................... 74

6. Research limitations .................................................................................................................. 77

7. Recommendations for further research ................................................................................... 79

List of References: ....................................................................................................................... 80

Appendices ................................................................................................................................... 86

Appendix 1: Coding of the Research model .............................................................................. 86
Appendix 2: Semi-structured interviews question guide ............................................................. 87
Appendix 3: Summary of semi-structured interviews .................................................................. 88
Appendix 4: Questionnaire design ............................................................................................... 89
  a) Summary of Cover Letter .................................................................................................... 89
  b) Summary of Questionnaire Design ....................................................................................... 90
  c) Actual layout of questionnaire in Google Forms® .............................................................. 93
Appendix 5: Data collected by questionnaire (responses spreadsheet). ...................................... 99
Appendix 6: Highly and moderately correlated success factors ................................................ 104
List of Tables and Figures

Figure 1.1. Scope of the study ............................................................... 9
Figure 1.2. Structure of the study ....................................................... 10
Figure 2.1. Annual number of flats in Ukraine .................................... 13
Figure 2.2. Motivation of study construction industry in Ukraine .......... 14
Figure 2.3. ‘Project success’ and ‘project management success’ distinguish .... 15
Figure 2.4. Difference between critical success factors (CSFs) and key performance indicators (KPIs) ..................................................... 16
Figure 2.5. Hierarchical Model of Construction Project Success ........ .... 17
Table 2.1. Aggregated findings on success factors studying ...................... 27
Figure 2.6. Project success factors time framework ............................. 31
Figure 2.7 Research model ................................................................. 32
Figure 2.8 Methodology approach of the study .................................... 33
Figure 2.9 Deductive research approach ............................................ 35
Table 4.1. Project managers’ business experience ............................... 48
Table 4.2. Respondents’ area of operations ........................................ 49
Table 4.3. Respondents’ company size in terms of employees .......... .... 49
Figure 4.1. Values of groups of factors for construction projects in Ukraine 50
Figure 4.2. Project success criteria and project success groups of factors .... 52
Figure 4.3. Average ranks for groups of factors regarding respondent’ experience .... 53
Figure 4.4. Changing significance of groups according to a project profitability growth . 54
Figure 4.5 Summary of groups analysis ........................................... 56
Figure 4.6 General overview of success factors significance .................. 57
Figure 4.7. Significance of success factors related to the project management group ... 59
Figure 4.8 Significance of success factors related to the human group .......... 60
Figure 4.9. Significance of success factors related to the environment group ........ 61
Figure 4.10 A generic list of significant factors influencing project success in Ukrainian construction industry ................................................. 63
Table 4.4. Rules of thumb ................................................................. 64
Table 4.5. Highly correlated success factors ..................................... 64
Table 4.6. Project manager’s experience interrelationship .................... 66
Table 4.7. Client’s type and size interrelationship ............................... 67
Table 4.8. Client’s knowledge and experience interrelationship ............ 68
Table 4.9. Contractors’ competences interrelationship ........................ 69
Table 4.10. Tendering interrelationship ............................................. 69
Figure 5.1. Framework of success factors significance ......................... 73
Table 5.1. Interrelation spread between success factor areas ................ 74
Table of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEEC</td>
<td>Central and Eastern European Construction</td>
</tr>
<tr>
<td>CSF</td>
<td>Critical Success Factors</td>
</tr>
<tr>
<td>EECME</td>
<td>East European Construction Market Expert</td>
</tr>
<tr>
<td>EFQM</td>
<td>European Foundation of Quality Management</td>
</tr>
<tr>
<td>GPMF</td>
<td>Global Project Management Forum</td>
</tr>
<tr>
<td>IBRD</td>
<td>International Bank of Reconstruction and Development</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>KPI</td>
<td>Key Performance Indicator</td>
</tr>
<tr>
<td>NBU</td>
<td>National Bank of Ukraine</td>
</tr>
<tr>
<td>PM</td>
<td>Project manager</td>
</tr>
<tr>
<td>UPMA</td>
<td>Ukrainian Project Management Association</td>
</tr>
<tr>
<td>USCS</td>
<td>Ukrainian State Committee of Statistics</td>
</tr>
</tbody>
</table>
1. Introduction

1.1. Background

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).

Ukrainian economy is recognized as a highly attractive one in terms of general business perspective (The World Bank, 2008) and particularly for investments in construction projects (CEEC, 2008; USCS, 2008). During the 2007 the amount of construction firms increased on 15% comparing to year 2006 and on 70% during last five years. Capital investments growth reached 50% during 2007 year and 480% comparing to 2002 (USCS, 2008).

However, other sources indicate a high risk for a business in this sector. According to Ukrainian State Committee of Statistics (2008) there are more then 30% of enterprises in construction industry recognized as a detrimental during 2007. Moreover, IBRD, Doing Business Report (2008) indicates plenty of parameters supporting complicacy of success on this market. It seems axiomatic that every project tends to succeed. However, current dual situation in Ukrainian construction industry stresses a challenge of deliver a success outcome of projects and arise a question on which factors stipulate project success in this market.

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 it practical impact on resource allocation process and managerial tools application.

However, there is still a lack of understanding what really contributes to a project success analysing specific industry and certain geographic areas. Considering the dynamic nature of construction industry, the number of housing projects and rapidly changing environment of developing Ukrainian economy the following research question will be significant.

What does it make construction projects successful in Ukraine?

Therefore research aims of this study are:

1. To identify a list of success factors significant in housing construction projects in Ukraine.

2. To investigate possible interrelations between success factors in housing construction projects in Ukraine.
1.2. 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 1.1.

In terms of geographical coverage this study is dedicated to one single country – Ukraine. Only managers who work in this country 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.

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.

Therefore, current research makes an effort to identify which of the factors have the highest impact on housing construction project success in Ukraine.
1.3. Structure of study

Present study consists of five parts and has the float presented on Figure 1.2.

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 in Ukraine 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 Ukrainian constructions. It also provides study of interrelations between factors.

**Conclusions** summarize achieved results, formulate limitations and eliminate areas for possible further studies.
2. Literature review

Success in housing construction projects is hazardous matter and might have numerous limitations (factors of failure) and drivers which can lead to successful delivery of a project (factors of success) at the same time. During around half of century researchers in project management field have been working on identification of project success factors. However this area of interest continues to motivate both academician and practitioners to investigate on factors which lead to project success regardless the amount of studies that already have been done.

Literature review as a part of this research aims to clarify different aspects of study in terms of concepts and reflect what has been already published on a topic by other researchers and scholars. In order to demonstrate a logic which was followed here, it would be useful to develop an idea path. Therefore,

- firstly an overview of construction projects is presented and Ukrainian housing construction industry is analysed (2.1),
- secondly, a discussion of the concepts of success in construction project management is provided (2.2),
- next step addresses project success factors themselves ordered according to time of appearance in studies (theoretical point of view) (2.3),
- then criticism of success factors (2.4) and contribution from practitioners (practical point of view – 2.5) are discovered, and
- the last step aims to finalize findings and make a base for survey implication (2.6).

2.1. Construction projects. Housing Construction industry in Ukraine

Originally construction project have 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 can not 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.

Nowadays, construction industry is recognized as the most dynamic sector of East Europeans economies. A total market size counts around 250 million of people (EECME, 2008) which makes it attractive for investors in terms of rate and period of return.

A situation on Ukrainian construction market is not an exception; it follows a common for Eastern Europe trend. Ukrainian State Committee of Statistic declares a rate of economic efficiency of construction industry in Ukraine equal to 2.6% in 2007 (USCS, 2008) which seems to be reduced comparing to a rate of staple industries, for instance, which is around 5-6%. In contrast to government reports commercial analytics also claim that this rate is much higher in reality and reached 20% in the same period (Документинформ, 2008). This is one of existing contradictions between official reporters, company’s interviewers and independent analysts in Ukraine which leads to reduction in reliability of most of resources. Furthermore, Ukrainian construction industry is recognized by Global Project Management Forum (GPMF, 2008) in its country report as ‘industry which needs more or better project management’. The same report states that there are no project management standards in Ukraine even in spite of wide specter of project management applications, establishment of UPMA (Ukrainian Project Management Association) 16 years ago, and high speed of project industries growth (construction, consulting, shipbuilding and aircraft building).

In 2008 in cooperation with KPMG Central and Eastern European Construction (CEEC, 2008) Research has produced Ukraine construction qualitative research. It is based on 246 face-to-face interviews with representatives from Ukrainian construction sector. These interviews were produced in order to cover main aspects of industry’s current state and its potential development in coming future. Experts report that there is a significant growth in industry and moreover all construction companies participated in survey had strong expectations on market development in 2009-10. Apart of evident growth in industry generally and in each construction company specifically there are number of limitations which also increase. Particularly a lack of skilled labour resources, high competition, increasing material costs, insufficient financial resources and bureaucracy were addressed as the most crucial factors restraining construction development. These limitations also could be considered as barriers within the industry. In addition to this construction industry might be characterized by a weak transparence and numbers of bribes in tendering process. In spite of growing limitations within the industry the survey results demonstrate companies’ ability to manage an impact on business performance and their optimistic expectations on future returns from investments in Ukrainian construction projects.

Particularly housing building, representing one of the largest sectors within the construction industry, nowadays grows fast in Ukrainian economy. 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).

Ukrainian State Committee of Statistic restricts housing constructions by
1) mass building (including one; two or more rooms),
2) individual building (including one; two or more rooms),
3) residential building:
   - for elderly and disabled people,
   - for students,
   - for other social groups (as for refugees, for workers, for orphans, for homeless persons)

Mass housing and individual building more refer to commercial construction companies in Ukraine, whereas social construction projects are mostly linked to governmental practice. Development of housing construction industry in Ukraine is presented on Figure 2.1. below.

From the chart above it could be seen that there is a constantly growing trend in number of flats built every year. In spite of general increasing trend a reduction in growth rates during last seven years is evident.

General Ukrainian construction industry review is reflected in various publications. However, it seems challenging to obtain independent and objective evaluation of current situation. Moreover, there are plenty of contradictions in both qualitative and quantitative evaluation regarding the research executors. This fact reflects a necessity of analysis and
industry studies in order to overcome information non-transparency. In addition to this, English sources in this field are very rare which once more points on a gap in this area. Considering optimistic forecasts and absence of clear market standards, limited publications and wide specter of project oriented industries, active participation of UPMA and a lack of project management practice, a gap in studies seems to be obvious (Figure 2.2.). A lack of studies likely causes a deficit of information in housing market and therefore inefficiency in actions. Therefore, research in Ukrainian project-based sectors attracts our attention.

![Weaknesses and Strengths Diagram]

Figure 2.2. Motivation of study construction industry in Ukraine

2.2. Conceptual fundamentals

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 2.3.). 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 Kumaraswamy, 2002; Chua et al., 1999).
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 2.4 illustrates clearly this approach.

![Diagram showing the relationship between project objectives, performance goals, and project management system.

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 2.5) 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.

![Diagram showing the difference between critical success factors (CSFs) and key performance indicators (KPIs).

Figure 2.4. Difference between critical success factors (CSFs) and key performance indicators (KPIs)

Source: Toor and Ogunlana (2008)
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.

2.3. Project success factors. Theory perspective

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.

1960s

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.
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

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 study was introduced by Avots (1969) and it suggested wrong choice of project manager, unplanned project termination and unsupportive top management as main reasons lead projects to a failure. His findings seem to be similar to others in terms of focus on strong plan, feedback system and project manager skills however he also invented an idea of extreme importance of top management encouragement which later will appear several times in different research findings. In spite of the fact that Avots (1969) in his paper illustrates clearly a support to detailed scheduling he also finds change management to be crucial for overall project outcome.

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 behavior.

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 then 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 indicate 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
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

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 form 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 inter-connections among them.

Thus, Belassi and Tukel (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, economical, social and technological issues. The fact that client and sub-contractors 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 then 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) summarize 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 Ukrainian 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 stakeholders 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 studies 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 2.1. 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.
<table>
<thead>
<tr>
<th>Success factors</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>type, scope (Chan et al., 2004); clear objectives (Fortune and White, 2006); scope (Cooke-Davies, 2002); clear objectives, realistic budgeting (Yu et al., 2006)</td>
</tr>
<tr>
<td>Project Management</td>
<td>planning, feedback (Avots, 1969)</td>
<td>scheduling, monitoring, control (Sayles and Chandler, 1971); plan, control, review (Martin, 1976)</td>
<td>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)</td>
<td>feedback, communication, decision making effectiveness (Belout, 1998; Walker and Vines, 2000); planning, monitoring, control (Jaselkis and Ashley, 1991; Belassi and Tukel, 1996)</td>
<td>planning, control, managerial actions (Chan, 2004); communication, plan, control (Chan and Kumaraswamy, 2002); control, decision making, communication (Yu et al., 2006)</td>
</tr>
<tr>
<td>General management and organizational aspects</td>
<td>top management support, change management (Avots, 1969)</td>
<td>general management support (Martin, 1976)</td>
<td>top management support (Cleland and King, 1983); general management efficiency, organizational aspect (Nahapet and Nahapet, 1985); top management support (Pinto and Slevin, 1989)</td>
<td>organizational structure, safety and quality assurance programs (Walker and Vines, 2000); top management support, organizational structure (Belassi and Tukel, 1996)</td>
<td>flexible management, change management (Yu et al., 2006); organizational structure (Chan et al., 2004; Chan and Kumaraswamy, 2002)</td>
</tr>
</tbody>
</table>
## Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

<table>
<thead>
<tr>
<th>Success factors</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
<th>2000s</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Procurement</strong></td>
<td>______</td>
<td>______</td>
<td>______</td>
<td>______</td>
<td>(Chan et al., 2004; Chan and Kumaraswamy, 2002; Fortune and White, 2006; CEEC and KPMG, 2008)</td>
</tr>
<tr>
<td>Resource allocation (Martin, 1976)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Environment</strong></td>
<td>______</td>
<td>______</td>
<td>______</td>
<td>______</td>
<td>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)</td>
</tr>
<tr>
<td>______</td>
<td>______</td>
<td>______</td>
<td>______</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>People</strong></td>
<td>______</td>
<td>PM competence (Sayleas and Chandler 1971)</td>
<td>Client characteristics, personnel capabilities (Cleland and King, 1983); PM competence, project team qualification (Baker et al., 1983); PM competence and authority (Locke, 1984); client relations, qualified project team (Morris and Hough, 1987); PM competence, personnel power (Pinto and Slevin, 1989)</td>
<td>PM’s experience, commitment, competence, authority (Chua et al., 1999); client’s power (Walker, 1995); client’s type, experience, knowledge (Sonder and Molenaar, 1997); client relations (Munns and Bjerimi, 1996); client/user 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)</td>
<td>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, 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)</td>
</tr>
</tbody>
</table>

### Table 2.1. Aggregated findings on success factors studying
2.4. Criticism 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 success factors in Ukrainian 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.

Almost 20 years ago 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.

2.5. Project success factors. 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), 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 actors 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.

2.6. Literature Review Findings

Literature review presented above has been developed in order to summarize existing knowledge and to eliminate possible contradictions and gaps in the field of project success factors.

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 factors 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.

All reviewed sources collect studies from different time frames and from different parts of the world however none of them relates to the post-Soviet area. It seems that commercial market researches and advisory reports are only the source to obtain relevant information about Ukrainian current industry situation. However, economies of former USSR countries have a huge potential and are growing fast increasing amount of possibilities. Particularly, construction industry is evaluated as the most dynamic sector of Eastern Europe economies and combines 250 million people market size (EECME, 2008).

In addition concerning limited number of studies on Ukrainian construction projects produced in English a necessity of investigation in this area seems evident. A relevance of study of industry with around 11% (CEEC, 2008) annual growth seems non-doubtful. Therefore, we tend to believe that clarification of success factors attributable to construction projects in Ukraine is significant and might initiate further study in this area.

Figure 2.6. reflects success factors extracted from different sources and which will be a base for answering a research question for this study.

![Figure 2.6. Project success factors time framework](image)

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 2.7) for the present research is seen as the following: success factors indicated in Literature Review (Table 2.1) are considered as independent variables
and presented in six groups \((X_1, X_2, X_3, \ldots, X_5, X_6)\) 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.

This research focuses on investigation of significance of selected success factors (see Appendix 1) for project success in conditions of Ukrainian 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 Ukraine.

**Hypothesis 2:** all the success factors of the research model (Appendix 1) are interrelated in their impact on construction projects success in Ukraine.
3. 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.

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. Research philosophy

Sometimes it seems obvious which research philosophy to use in order to develop knowledge in the chosen area understanding of its principals is critical for researcher since it affects dramatically the entire methodology design. This statement is supported by Saunders et. al. (2007) who positions research philosophy as the outer circle of his ‘onion’ model. Bryman and Bell (2003) argue that epistemological considerations underline any research since it answer the question of acceptability of the knowledge developed by the study. Hence, the choice of the research philosophy influences not only the research strategy but also data collection methods and analysis and conclusions of the study.

Even though some authors claim that there is a ‘frequent overlap’ between positivism and interpretivism (Ticehurst and Veal, 1999) most of them agree that the two philosophical paradigms are contrasting each other (Saunders et. al., 2007; Bryman and Bell, 2003).

The positivism approach adopts in social science research philosophy developed by natural scientists (Saunders et. al., 2007; Bryman and Bell, 2003). Independent researches see the social world as external process (Ticehurst and Veal, 1999) trying to develop ‘laws and rules’ frequently using statistical analysis as the main tool (Saunders et. al., 2007).

On the contrary interpretivism considers natural science methods inapplicable to social processes and people. The main arguments of this paradigm are that business situations are too complex and majority of them are unique. Therefore the generalisability of research is questioned. Moreover, taking into account current turbulent business environment, even a three month study might be not relevant in current conditions (Saunders et. al., 2007). Different interpretivism theories exist in the literature like Verstehen approach or phenomenology however the main distinguish of interpretivism as a whole is a subjective, descriptive approach in social study.

Even though the research question of this study has a primary focus on the complex social aspect positivism research philosophy was chosen. Concentrating on description of single successful projects in housing construction industry in Ukraine it seems impossible to drive to conclusions about industry overall. Statistical techniques employed at this approach will be more useful to gather facts to make this type of generalizations. Since the main purpose of this study is finding general trends in the industry and uncovering facts positivism philosophy seems more appropriate (Ticehurst and Veal, 1999) regarding the research question of the study.

3.2. Research approach

Deductive approach to research is seen as one of the main principles of positivism philosophy (Ticehurst and Veal, 1999; Saunders et. al., 2007) and seems 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 analyzing them develop the existing theory. Picture 3.2 illustrates the deductive approach of this study.
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 Ukraine.

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

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 Ukraine.

### 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 provides 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 answer 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 Ukraine 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 Ukrainian market is considerably limited this step might help to develop the aggregated table of success factors by adding success factors particular for Ukrainian economy. Then a questionnaire will be distributed among housing construction project managers in Ukraine 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.

(Adopted from Saunders et al. (2007) and Creswell (2003))
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 researches 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 requires 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 Ukraine identified both by the aggregated literature review table and interviews with managers. It is complemented then by exploratory approach which by analyzing 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 Ukraine 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: Pre-study

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 Ukrainian 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 Ukrainian 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.

Semi-structured interview methodology is defined by Collis and Hussey (2003:167) as a “method of collecting data in which selected participants are asked questions in order to find out what they do think or feel.” 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 then 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 believes 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 Ukrainian 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 Ukrainian 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.

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
Ukrainian 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 Ukrainian peculiarities 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 process was placed after the first one to avoid bias responses. Only after managers identify success factors which they think influence housing construction projects in Ukraine a list of factors 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 Ukrainian 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.

**Interview procedure**

Due to a number of constraints like geographical location of interviewees and interviewers, time or budget telephone interviews were conducted with three construction project managers in Ukraine. Two managers were geographically located in Kyiv and one manager in Odesa. The managers have 8 ears of construction projects experience in average. Additional reason for selecting these particular managers was there involvement in housing construction projects in Kiev and Odesa. A set of subsequent interviews was carried out the week before questionnaire was sent to respondents.
The length of interviews was limited to 45 minutes due to availability of interviewees however the first interview proved that this time span is significant enough to obtain answers on the main questions. All the three managers provided information both regarding groups of success factors and commented questionnaire design. Two interviewees expressed interest to completed the questionnaire after the interview was over. A link with the survey was sent to them with an interview follow up letter.

All the three interviewees allowed us to take notes of the entire interview process after being assured that the data will be kept confidential and will be used in study purposes only. 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 adjustments were made to the questionnaire.

3.6.2. Self-completion mail questionnaire: Main Study

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. According to Ticehurst and Veal (1999) the postal questionnaire is the ‘only practical technique to use’ in this type of research. First of all the respondents are geographically wide spreader and the number of the sample size make it difficult to conduct a face-to-face interview. Therefore the self-completion mail questionnaire gives the advantage of surveying a large sample at a low cost in short period of time (Bryman and Bell, 2003; Ticehurst and Veal, 1999).

Sample accuracy

Another important area of the data collection technique section which might require further substantiation is the characteristics of project managers sample which was chosen to represent the housing construction industry of Ukraine. 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 can not 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 geographical regions, 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).

However the same technique can not be applied when we speak about respondents to the survey sent by post. Ticehurst and Veal (1999) call this a ‘self-selected’ sample since the researcher is able to analyse the data from the respondents who agreed to answer the questionnaire only. Therefore a non-response bias might decrease the level of research accuracy (Cooper and Schindler, 2003; Saunders, et al., 2007). Ticehurst and Veal (1999) argues that ‘there is little that can be done about this except achieving a high response rate’.

One of the possibilities to minimize the risk of low response rate is following the framework developed by Ticehurst and Veal (1999) and supported by other authors as well (Bryman and Bell, 2003; Ghauri and Gronhaug, 2002; Collis and Hussey, 2003). The main elements of this framework were addressed before mailing the questionnaire to potential respondents. First of all, accompanying letter was attached to every e-mail with the questionnaire sent. The main aim of this letter was to provide clarifications about the purpose of research and increase the managers’ willingness to respond. Secondly, a reminder and a follow-up emails were sent. Reminders were sent in a five days time to those managers who did not respond to the first e-mail. The follow-up letter was sent to all the participants of survey another five days after the reminder.

Sample precision

Since the focus of the research is on Ukrainian 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, geographical location 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.

First of all one of the sample refineries is closely connected with the accuracy of the sample discussed above. Since information about construction project managers in
Ukraine is obtained only via a selection of electronic databases other construction project managers can not be contacted by this survey. This is seen as a significant limitation since it might be argued by statisticians that the focus of the study might shift from construction industry in Ukraine to construction companies registered in on-line databases. However taking into account current level of information technology development we consider that majority of the companies will be listed in this databases and only insignificant amount of population will not be contacted.

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.

Thirdly e-mails were refined basing on their extensions. To reduce the ‘uninformed response’ (Saunders, et al., 2007) e-mails with extensions like info@xxx or office@xxx were excluded from the mailing list.

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.

**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 Ukrainian housing construction industry the population size is very unlikely to be known as no records of industry employees exist in the country. 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,
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

as identified above, is unlikely to exceed 30 per cent the questionnaire will be sent to minimum 100 housing construction project managers in Ukraine.

Questionnaire design

According to Collis and Hussey (2003) questionnaire is performed as a list of questions 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 appropriative. 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.

Respondent 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 can not be made regarding dominance of one factor on others.

Success factors analysis:
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 designed 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.

**Questionnaire analysis**

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

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’ companies 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.

Than 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.
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 Ukraine in order to include options that were not covered by questionnaire before. As a result of this stage the framework developed on literature review was checked on applicability to Ukrainian construction industry.

3) to add and to correct questionnaire (several features were 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 was proven to be applicable. Additional factors mentioned by respondents were already covered be existing framework.

4) to test questionnaire on small group of people (free persons) to understand its clarity. On this stage informants were required to describe their perception and understanding of categories. Due to need of translation of success factors to a foreign language this stage was given very high priority since direct translation sometimes was not possible. Therefore interviewees were asked to describe their understanding of each factor to ensure that the meaning remain the same in both languages.

5) to spread the final questionnaire among housing construction project managers in Ukraine Google docs® were used to power on-line survey. Cover later with the Web-link to the form was e-mailed to 120 project managers in Ukraine who are mainly involved in housing construction projects. Answers appeared in the spreadsheet and were 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 per cent 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 per cent’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 that 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

Any research in social science area to ascertain extent deals with the question of 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 can not 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. Mis-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.
4. Findings and Discussion

This chapter focuses on analysis of data collected by a questionnaire from Ukrainian housing construction project managers. 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 hypothesizes. 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 Ukraine.
2. Identifying possible interrelations between success factors in housing construction projects in Ukraine.

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 Ukraine. 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 in several steps. First of all 120 e-mails were sent to the refined addresses of housing construction project managers in Ukraine. From this list 8 e-mails appeared to be non working and were excluded from the list. Secondly a reminder was sent in five days to those managers who did not completed the questionnaire followed by a follow up letter in another five days.

This was done in order to maximize the response rate (Ticehurst and Veal, 1999) and obtain a bigger sample size. However the number of filled in questionnaires totaled to 28 of which 2 forms could not be analyzed due to irrelevance of responses. The response rate equaled to 22% which is slightly lower then the response rate considered acceptable for this type of research (Sekaran, 2003). Nevertheless some authors argue that even a response rate of 13% might be used to conduct a quantitative research (Hoang and Lapurnuaypon, 2008).

Even though the precision of such sample might be statistically questioned which will influence the reliability of the whole study it was decided that the data collected was significantly enough for further analysis particularly taking into account the quality of the data obtained.
Characteristics of the sample might prove that responses obtained from the individuals could be extremely helpful in order to answer both the research questions. Nine of the respondents were executive directors or owners of construction companies, 14 persons were directly involved in management of projects or described their job position as project leader or head of project department. Only 3 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 4.1 presents a summary of respondents experience in construction projects managerial positions.

<table>
<thead>
<tr>
<th>Years of business experience</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 2</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>2 to 4</td>
<td>31</td>
<td>39</td>
</tr>
<tr>
<td>5 to 7</td>
<td>38</td>
<td>77</td>
</tr>
<tr>
<td>More than 8</td>
<td>23</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 4.1. Project managers’ business experience

Ukraine recognized project management as a profession only in 1999 (UPMA, 2008). In addition construction industry after becoming commercialized in 1992 started to develop only from 1996 (Документинформ, 2008). Therefore there were very little possibilities for managers to gain more than 10-12 years of relevant experience in the area of construction project management.

Analyzing the data from this perspective it seems likely that the respondents had a vast experience in housing construction projects area (62% have more than 5 years on managerial positions, another 31% 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 be the fact that all of respondents are currently involved in housing construction projects. Managers have chosen this option among others as a response for the check question in the survey. Refinery technique applied to the mailing 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.

As shown in Table 4.2 majority of the companies (almost 60%) which took part in the survey operate in different parts of the country. According to one of the interviewee ‘it (operating in different regions of Ukraine) became a kind of a standard in the industry since after commercialization of construction projects companies can include the cost of construction team relocation to the project cost. It does not really matter were to built…’. However region companies are also present in the sample by quite a big group of almost 40 percent. It might increases the quality of the sample by focusing not only on big or...
mobile housing construction companies but also taking into account smaller firms which operate only in specific regions of the country.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number of responses</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region in Ukraine</td>
<td>10</td>
<td>38.5</td>
<td>38.5</td>
</tr>
<tr>
<td>Ukraine</td>
<td>15</td>
<td>57.7</td>
<td>96.2</td>
</tr>
<tr>
<td>Worldwide</td>
<td>1</td>
<td>3.8</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2. Respondents’ area of operations

Sample description by company size is presented in Table 4.3. As an indicator of size number of employees was chosen. Since the first division into five groups provided almost equal number of responses data collected was regrouped as presented in the table. More than half of the respondents work in medium companies with less than 4000 employees. This group is followed by small companies with less than 500 employees. In addition two responses indicated that more than 4000 employees work for the company.

<table>
<thead>
<tr>
<th>Company size</th>
<th>Number of responses</th>
<th>Percent</th>
<th>Cumulative percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small (up to 500 employees)</td>
<td>10</td>
<td>38.5</td>
<td>38.5</td>
</tr>
<tr>
<td>Medium (from 500 to 4000 employees)</td>
<td>14</td>
<td>54.0</td>
<td>92.5</td>
</tr>
<tr>
<td>Large (more than 4000 employees)</td>
<td>2</td>
<td>7.5</td>
<td>100</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>26</strong></td>
<td><strong>100</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.3. 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 mangers 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 Ukraine.
Secondly, sample parameters might be used in further analysis of success factors from different perspectives. Impact of diverse factors in Ukrainian 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.

4.2. Groups of factors discussion

This part comes to finalize findings on groups of success factors in construction projects in Ukrainian economy. It aims to clarify a priority of clusters for construction industry basing on results of questionnaire completed by project practitioners in Ukraine. 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 4.1 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 (24%), human aspect (22%) and environmental impact dominate in construction projects in Ukraine.

![Figure 4.1. Values of groups of factors for construction projects in Ukraine](image)

**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. During the interview which preceded survey one of participants mentioned:

“… it is like baking a cake… Ingredients matter but techniques and order of their application take the first priority in an overall success”

- Respondent 1

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 a decision making ability. Although the last factor was confusing for one of respondents, it was decided to leave it in questionnaire with slight changes in translation.

Next category related to human factors takes a second place in the list of the most influential group of factors for Ukrainian housing constructions. This cluster involves a big variety of project participants which were selected as dimensions. Therefore it includes a wide specter of factors which are aligned to each dimension. For instance, under client dimension there are clients’ knowledge, experience, size and type. 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.

Environmental aspect is also evaluated as highly significant on the way to project success. However, this group tends to have an extreme temporary influence on projects’ outcomes. The questionnaire is structured with a reference to the last project which was completed by respondent. As it was broadly discussed in the methodology part of present research the main reason lies in an attempt to avoid average discussion and to make answers as closer to practice as possible. That is why political, economic, technical and technological changes during last years are directly reflected on results. Thus, for example, if economic situation is stable the results might not demonstrate any significance of environmental group; however, if the economic crisis takes place it increases an importance of this group dramatically. Therefore, it seems logical to avoid direct conclusions on a possibility for environmental group of factors to make an impact on project success; especially analysing developing markets.

Another three groups of success factors were valued almost equally. Thus, factors related to organizational aspect and corporate management were given 13%, whereas procurement and project characteristics groups received 11% and 10% accordingly. The rank of procurement related factors appears low which appeared unexpected due to its significant role particularly in construction projects assigned by different authors (Pocock et al., 1997; Kumaraswamy and Chan, 1999; Fortune and White, 2006 and others). However, to find a reason of the contradiction factors under this cluster have to be analysed separately and in depth. In addition project characteristics seem to be slightly neglected. Paralleling answers of questionnaire with interview responses, one of the reasons of undervalued group seems to become clearer. One of respondent mentioned:

“Success is not about a project size or type. Each project is unique in its scope. On my opinion, to deal with a different project type successfully is more a question of professionalism...”

- Respondent 2

Although one answer can not be counted as a base for generalization, it might give one of the possible explanation of a low grade given to this group of factors.

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. Below received information is eliminated from different angles with the discussion on it.
Firstly, it would be interesting to eliminate any possible relation between project criteria and project success factors. This link appears attractive for investigation due to an assumption that managers orientated on budget indicators, for instance, might evaluate factors related to project management (planning, control and others) as a first priority. And at the same time project leaders successful in stakeholders’ expectations dimension would tend to give a priority to a human group of factors. To cast light on this connection the radar diagram was build (Figure 4.2.).

![Radar Diagram](image)

**Figure 4.2. 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. The averages were calculated as arithmetical averages basing on managers’ last project performance in terms of success criteria. For example, an average value for grades given for each success factors clusters assigned by all respondents evaluated their last project as successful (conferred the rank of 4 or 5) in terms of time was calculated. The same operation was proceeded in order to build the chart.

From the radar diagram it seems obvious that there is no dramatic difference 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 some slightly different values. Thus, project management was indicated as a ‘highly important’ in case of time success, stakeholders’ expectation and project goals. 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 time might appreciate detailed schedules and time frames and consider them as success factors for the last project; and therefore indicated project management category as a ‘highly significant’ for project outcome. Stakeholders’ expectations and project goals also
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

seem to be formulated in plans, milestones and therefore precise project management has a high value as well.

High quality project delivery points on somewhat bigger importance of environment group and a little insignificant procurement category. Although it seems difficult to find explanation for an environment power, procurement appears even undervalued. In spite of the fact that procurement factors were stressed by studies in construction field, it seems ignored.

Budget success has an extremely low value on environmental 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 project goals. Therefore, to satisfy stakeholders’ expectation for project manager is likely to be associated with an overall project goal.

Interestingly, there is almost no difference between project success criteria in project characteristics and human groups of factors. Group of project characteristics is likely to be insignificant regardless success criteria. However, human 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.

Secondly, categories of success factors were analysed regarding project managers’ experience. Figure 4.3 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 4.3. Average ranks for groups of factors regarding respondent’s experience](image)

Figure 4.3. Average ranks for groups of factors regarding respondent’s experience
Thus, factors related to people in project tend to lose their importance with an increase in project managers’ experience. However, at the same time significance of environmental cluster of factors rises. It might be connected to the fact that more experience managers shift focus from internal forces to external. Moreover, years of experience might increase the scope of project that managers lead and it enlarge project’s visibility which in its turn changes a possible impact of external factors (Gardiner, 2005). This fact also could be a possible explanation of a slight growth in procurement group which might be seen from diagram.

Despite of existing tendencies some groups appear to remain stable or changing insignificantly. In this way project characteristics category seems changing up and down without a particular trend; project management group also looks almost like a horizontal line stressing its steadfast importance on project outcome; corporate management cluster tends to increase on the beginning but generally might be described as ‘invariably significant’. Generally it seems challenging to find a trustful explanation on trends which do not have clear motions. For instance, a difference in 2-4 points in average rank might be a particularity of projects only and therefore does not provide with a right for generalization.

In addition groups of factors seem to be more balanced for a middle slot and disproportional at the ends. It might reflect a process of professional reappraisal of success in general and success factors particularly. It seems also possible that apart of professional growth global structural processes (such as economic changes and others) might take place.

Thirdly, an investigation on significance of groups of factors according to project profitability was measured and analysed. Figure 4.4 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.

![Significance of groups of factors regarding project profitability](image)

Figure 4.4. Changing significance of groups according to a project profitability growth

From the figure above several trends could attract an attention.
The first trend might be seen in an extreme decrease of importance of environmental group. This fact might relate to a possible insurance actions implemented to secure projects with a potentially large profits. It was pointed by one of respondents during the interview:

“… dealing with long and large projects we prefer to insure parts of projects or its processes in different ways. Ukrainian construction market has never been so stable to avoid it completely.”

- Respondent 1

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 might provoke unprofitable outcome for protracted 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. However, a discussion on reasons caused this phenomenon appears ungrounded unless deeper research in this area would be produced.

Another tendency might be seen in a group of factors related to a project management. The fluctuating curve represents an increasing trend. In spite of a sharp shape it looks similarly to a procurement group curve. Procurement as a function could be addressed to a project management group as well. However, for the purpose of current study concentrated on construction projects, procurement related factors were separated in a single group. Therefore, it might be an explanation of unidirectional motions of these groups.

Moreover, other interrelated groups regarding project profitability could be discussed. Thus, project success factors related to a human aspect seem varying similarly to the corporate (general) management group. Adding to this, project characteristics group seems to follow the same shape as the groups described above. It appears undervalued for the projects with a very low and low profitability, but at the same time, constantly increasing, this group reaches its high importance for projects with a high and very high profitability. The reasons of similarities in trends appear unclear and require deeper analysis taking into account interdependencies between single factors with a respect to profitability.

Generally all trends provided on the Figure 4.4 look abruptly with extreme changes in flow. Initially a smoothness of trends might depend upon a number of values taking into consideration. For this study 26 completed questionnaires were received which became an information platform for the later analysis. To reduce dramatic fluctuations and to increase an accurateness of trends more data would be required. Apart of the shapes, positions of graphs on the chart might be also interesting. Thus, project management and human factors stay over other groups which stress their dominate position regardless profitability of projects. Corporate management and organization, project characteristics and procurement clusters could be rated as factors with a low importance indifferent to project financial effectiveness. There seems to be a small gap between values assigned to each of these groups especially for middle and high profitable projects which might point on their mutual insignificance for project success. A comparative position of environmental group seems to be difficult for analysis as it was overvalued for projects with a very low rate of profit and then its importance decreases. Excluding curve behavior on the first part of the scale it might be concluded that environmental group constantly occupies the third place of significant groups after project management and human factors. In addition disproportion in ranks distribution among groups presents more in project with a very low,
low and very high profitability, whereas middle slots seem to be more balanced. The same effect was described when groups were presented with a respect to the project managers’ experience.

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 4.5):

- Primary project success areas with a high priority groups of factors (project management, human and environmental factors), and
- Supporting project success areas with the lower significance of groups of factors (procurement, corporate management and project characteristics).

This fact appears evident from the Figure 4.1 where primary success area received around twice more attention in terms of significance than supporting area groups. From the diagrams 4.3 and 4.4 this effect of two clusters could be noticed as well even despite the fact that there are some fluctuations within the areas depending on variables. For example, with a growth of project profitability, priority of groups in each area also changes accordingly. Moreover, considering results of analysis on project success criteria and success factors (Figure 4.2) the primary success area seems clearly dominative as well.

![Figure 4.5 Summary of groups analysis](image-url)
4.3. Success factors discussion

This part aims to develop an analysis of significance of each project success factor in Ukrainian 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 Ukrainian 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 4.6 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.

![Overview of significance of success factors](image)

The average ranks of success factors on the chart are demonstrated in a descending order from the most significant factor to the less important one.

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 some factors which are located in the ‘neutral’ zone; it is the lowest value rank which was received. User involvement, clients’ type and size, social factor and tendering were allocated to this grade. User involvement is likely to be on the right place on the scale due to complexity of end user inclusion in mass-housing construction projects. Clients’ type and size also appears insignificant in spite of Walker’s (1995), Songer’s and Molenaar’s (1997) findings about extreme power of this factor. Moreover, social factor seems to be undervalued in Ukrainian 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. Tendering was addressed as the least significant power in a project success in housing constructions in Ukraine. A reason seems likely to lie in a sphere of the long term relations preference above other methods of supplier selection (CEEC and KPMG, 2008). The Ukraine Construction Qualitative Study 2008 completed by CEEC and KPMG states that tenders are not very used method for supplier selection (25%), however the most mentioned methods are preferred partnering agreements (68%), long-term contacts/networking (62%) and recommendations (35%). Long-term relations and personal connections are highly important for obtaining new contracts with supplier in Ukraine. Therefore, it seems to be obvious why tendering was ranked as a non-powerful lever to deliver project successfully.

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

- Economic
- PM’s experience
- Qualification of project team
- Planning
- Clear objectives
- PM’s competence and leadership
- Political
- Monitoring and control  

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). Only one factor, project clear objectives, was highly ranked as a single and at the same time almost neglected as a component of a group of project characteristics. It seems likely that being a strong force in a project success, as it was stressed by many authors (Fortune and White, 2006; Yu et al, 2006, Hughes, 1986; Morris and Hough, 1987) this factor was possibly associated with another group by respondents while completing questionnaire. Moreover, Toor and Ogunlana (2008) emphasize a risk of allocation factors to a certain group pointing on possible difference in human perception of classifications. Nevertheless, clear objectives might be referred to the human group of factors as project goals are originated by client and their clarity depends on him/her. However, it could be also linked to a project management group due to its process of transferring project aims to plans and specifications. The fact of incorrect perception of this factor was not identified during the interview process and therefore it seems to become obvious at a discussion stage. An
invalid position of this factor also appears to be supported by the fact that another two factors from the same group (project scope and project type) were evaluated on the border between ‘important’ and ‘neutral’.

In the summary of groups of factors analysis the three most influential categories 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.

4.3.2. Success factors belonging to the project management group

Following Figure 4.7 illustrates a significance of each factor from project management group.

<table>
<thead>
<tr>
<th>Success factors related to a project management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Planning</td>
</tr>
<tr>
<td>Monitoring/ Control</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Decision making abilities</td>
</tr>
<tr>
<td>1    2    3    4    5</td>
</tr>
<tr>
<td>Planning</td>
</tr>
<tr>
<td>Monitoring/ Control</td>
</tr>
<tr>
<td>Communication</td>
</tr>
<tr>
<td>Decision making abilities</td>
</tr>
</tbody>
</table>

Figure 4.7. Significance of success factors related to the 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 Belou (1998) and Yu et al. (2006) who emphasize an importance of this factor for overall project success. This lever was also commented by one of respondents who mentioned that the exact meaning of factor was unclear for him/her. This fact was stressed during the interview as well and decision to make a slight change in translation was taken. Nevertheless, it might be counted as a reason of a low value of this factor comparing to others.
### 4.3.3. Success factors belonging to human group

Figure 4.8 presents arithmetical average of ranks ascribed to success factors from human group.

![Success factors related to human aspect](image)

From this diagram it seems obvious that environment group of factor was highly ranked mostly due to a large number of factors involving in it. Around 70% of factors are evaluated as ‘important’ or ‘neutral’. Therefore, it might be interpreted that human factors is too general group and combines plenty of factors which make it significant. However, to reduce an effect of quantity and increase quality further research is required; production of equal or proportional groups would be a suggestion to avoid similar situation in future researches.

Project managers’ experience seems to be the most valuable variable. However, ‘personal’ importance would be one of possible reasons. Most of the respondents occupy managerial positions in their companies and grading factors connected to project managers’ roles might be consider as a self-assessment and therefore might have overrated responses. Adding to this, project managers’ competence and leadership are also highly ranked which might refer to the same reason. Apart of these assumptions the actual high value of project manager experience could not be disregarded.

Moreover, it might be interesting that factors related to clients’ and users’ attributes stay on the bottom of the list of success factors importance. According to a gap between project managers’ competence and leadership factors from one side and relations with a project sponsor/ champion from another, it seems likely that human factors are addressed to project manager and his/her team rather than suppliers, clients and users.
4.3.4. Success factors belonging to environmental group

Figure 4.9 provides average ranks for success factors related to the environment.

![Success factors related to environment](image)

As could be seen from the Figure 4.9 economic factor is the most significant for housing construction projects in Ukraine. It was also mentioned earlier that a significance of factors from environment group seems to be strongly correlated to an actual situation in industry. These factors might be highly evaluated during political crisis, social changes or technological break. However, they also might be undervalued during stable periods.

To find a possible explanation of dominate position of economic factor some data might be helpful. Thus, according to The International Bank of Reconstruction and Development, Doing Business Report (2008) Ukrainian economy might be described with the following parameters.

During the report years 2007 and 2008 Ukraine was listed among the 26 countries all over the world made doing business in their economies more difficult.

- Reforms in Ukraine aggravated business conditions in a field of construction permits. It is one of the most difficult countries to deal with licenses (174th place out of 178) and one of the most regulated economies in the field of licensing in the world (429th place) (IBRD, Doing Business 09 – Report Overview). This fact transformed in bribes to Licensing Offices: 60% of firms expected ‘to give a gift’ to get a construction permit which hampers business efficiency, increases costs and risks of business in general and makes negative impact on project success specifically. Considering an amount of licenses needed in construction industry it makes business in this sector very challenging (Enterprise Survey, 2008).

- During the last years Ukraine was recognized as one of the most difficult places to pay taxes for companies (rank 177 out of 178). It requires 99 payments per year, 2085 hours per year with a total tax rate of 57,3% of corporate income (IBRD, Doing Business 07-08).

- Therefore, 24,43% firms expressing that a Typical Firm Reports reflect less then 100% of Sales for Tax Purpose, and

- in year 2005 47,97% of firms expected to pay informal payments to Public Offices (bribes) (Enterprise Survey, Ukraine, 2005). This fact is also emphasized by later
Enterprise Survey (2008) where 50% of Ukrainian companies indicate corruption as a main constraint for doing business comparing to 24% of companies in overall Eastern Europe and Asia region.

Currently Ukraine obtains 145th place out of 181 in terms of ease of doing business (IBRD, Doing Business 08 – Report Overview). The fact of severe business conditions in Ukraine appears evident. Therefore, listed economic forces could obviously provoke tough conditions for successful project realization and as a result increase a significance of economic factor in overall list of factors dramatically.

The next project success lever is a political one, which is also highly valued. Political and economic factors might be close to each other and interact between themselves. However, these relations will be examined in the next part of this study focusing on interconnections among factors. Nevertheless, political situation in Ukraine seems also somewhat pessimistic. Apart all the governmental issues, it would be more helpful to concentrate an attention on how political factors affected business.

Two respondents pointed in their questionnaire forms that bureaucracy strongly affects project success. It is supported by IBRD, Doing Business Report 05 – Removing Obstacles to Growth (2005) states that 44% of firms in Ukraine reporting that government regulations occupy 10% or more of senior management time. Bureaucracy could be considered as one of the most influential political force on the way to construction project success in Ukraine. Adding to this according to Enterprise Survey (2008) general political instability was named as a main obstacle for a business by almost 25% of the firms which is much higher than overall Eastern Europe and Asia index (around 16%). Moreover, political instability is followed by a tax rate and both of these parameters remain the most important obstacles regarding the size of companies which stress their strong positions.

Social, technical and technological factors seem to be insignificant for a project successful delivery especially with a comparison to strengths of previous factors. Moreover, Enterprise Survey (2008) states that around 26% of Ukrainian companies use technology licensed from foreign companies and do not depend on internal market. This rate is the highest comparing to Eastern Europe and Asia region.

4.3.5. Summary of success factors analysis

To summarize all findings described and discussed in this part of study it would be easier to evaluate significance of success factors demonstrably. Figure 4.10 reflects the list of success factors relevant for Ukrainian housing construction industry according to their significance for project success presented in a descending order. From this list factors assigned under corporate management, project characteristics and procurement groups were excluded basing on the result of part 4.2 of this research.

Besides the overall list it should be mentioned that only seven factors seem to have the strongest power on project outcome:

- Economic,
- Project manager’s experience,
- Qualification of project team,
- Planning,
- Project manager’s competence and leadership,
- Political, and
Other factors do not appear as powerful as the mentioned above and need to be compared to the values of factors from other groups.

![Generic list of success factors](image)

Figure 4.10 A generic list of significant factors influencing project success in Ukrainian construction industry

### 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 respondents 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. Managerial implications of these findings are going to be presented in the next chapter of the thesis.

It is widely argued in the literature which size of coefficient of correlation corresponds to which level of interdependence. Hair *et al.* (2007) suggests to apply the ‘rules of thumb’ when analyzing data for business studies (See table 4.4.)

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’.
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

Therefore both the approaches suggested by Cohen (2003) and Hair et al. (2007) were considered. For current research factors with strength of association more then 0.6 were considered highly correlated. Medium correlation was considered between 0.4 and 0.6. Correlation coefficients below 0.4 were not considered due to a high probability of being statistically insignificant.

<table>
<thead>
<tr>
<th>Correlation coefficient range</th>
<th>Strength of association</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.91 – 1.00</td>
<td>Very strong</td>
</tr>
<tr>
<td>0.71 – 0.90</td>
<td>Strong</td>
</tr>
<tr>
<td>0.41 – 0.70</td>
<td>Moderate</td>
</tr>
<tr>
<td>0.21 – 0.40</td>
<td>Small</td>
</tr>
<tr>
<td>0.00 – 0.20</td>
<td>Negligible</td>
</tr>
</tbody>
</table>

Table 4.4. Rules of thumb

Adopted from Hair et al. (2007)

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 analyzed.

Complete analyses is presented in Appendix 6

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 4.5. A detailed discussion about each pair of factors will be presented below.

<table>
<thead>
<tr>
<th></th>
<th>communication</th>
<th>social</th>
<th>political</th>
</tr>
</thead>
<tbody>
<tr>
<td>team spirit between key players</td>
<td>0.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>contractors’ competence</td>
<td></td>
<td>0.68</td>
<td></td>
</tr>
<tr>
<td>economic</td>
<td></td>
<td></td>
<td>0.61</td>
</tr>
</tbody>
</table>

Table 4.5. Highly correlated success factors

Team spirit between project key players and communication:

This pair of success factors correlation coefficient is the highest one in current research. Being equal to almost 0.8 it indicates a very strong association between the two factors. It might be concluded that success in housing construction projects in Ukraine if mainly...
dependent on team spirit between project key players will require managers’ attention to communication channels as well.

Moreover 60% of variation of one factor is explained by the other one ($R^2$ – coefficient of determination is equal to 0.598). Therefore in Ukrainian housing construction industry team spirit creation is likely to be closely related to communication among the team members. It seems unlikely that team spirit among key project players might be established without efficient communication.

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.

Therefore it seems likely that developing communication channels inside projects key players teams help to create team spirit between the members. However correlation coefficient might be also interrelated inversely. If there is a collaboration spirit between project key players and they act as one team it is likely that effective communication procedures exist as well.

**Contractors’ competences and social environment characteristics:**

Even though correlation coefficient of this pair of success factors is comparatively high (0.68), it is unlikely that association can be clearly understood. In this case this pair of factors might be analyzed in several different ways. It might present a general dependence between social characteristics of labor force which significantly influence the subcontractors’ competences or highlight a specific for Ukraine trend. Both of the possibilities will be discussed below.

High level of correlation between social characteristics of external environment and contractors’ competences might be a supporting argument to the general theory of increasing importance of human resources’ soft skills in project success (Gardiner, 2005). In case of housing construction industry in Ukraine such social characteristic like level of human resources’ education, might significantly influence on overall subcontractors’ competences. However this trend might be doubtful since strength of association between social characteristics and competences of project manager, project team or client are very low or even can be neglected.

On the other hand the causes of coefficient’s high significance might be explained be broad definitions of both terms ‘social characteristics’ and ‘contractors’ competences’. According to one of the interviewed manger the term ‘contractors’ competences’ was understood as ‘placing the lowest possible bidding price’ or in other words doing the work package required at the lowest price. Low cost of labor force in Ukraine might be one of the main reasons why Ukrainian subcontractors successfully operate not only in Ukraine but in Eastern Europe as well (IBRD, 2005). High level of correlation between the two factors might highlight specific for Ukraine trend that low cost of labor positively influence the contractors’ ability to provide services at lower prices, i.e. competence.
However there is always a risk when statistical tools are applied to business science called practical significance [Hair et al., 2007]. In some cases being statistically significant coefficients do not have any meaning or can not be clearly interpreted.

**Economic environment characteristics and political environment characteristics:**

Interrelation between political and economical environment characteristics has been broadly discussed in the literature [Johnson, et al., 2008]. High correlation coefficient obtained in current study supports that the same dependence is essential for housing construction projects in Ukraine. Being considerably young country Ukraine is still on its way to building free market relationships, therefore high level of dependence of economical performance on political situation in the country is quite predictable. Similar situation might be observed in other developing economies where project success is rather influenced by a group of external environment characteristics than a single parameter [Chan et al., 2004].

Regarding housing construction industry in Ukraine it might be that external project environment might be riskier than in a country where political and economical characteristics have lower correlation coefficients. Change in one of the parameters is very likely to influence the other therefore external environment becomes more difficult to manage and predict.

Several recent examples might support these findings and serve as additional indicators of interdependence between the factors. Recent political crises in Ukraine which forced the President to dissolve the Parliament [News Europe, 2008] resulted in special directive of The National Bank of Ukraine which frizzed all the operations concerning deposits’ accounts and limited credits issue [NBU, 2008].

It seems likely that such turbulent external environment might make it extremely difficult to manage long term construction projects. However awareness about high level of correlation among these two groups in Ukraine might help housing construction project managers to adjust risk management techniques accordingly to Ukrainian peculiarities when operating in this country.

### 4.4.2. Analysis of moderately correlated success factors

In order to discuss possible moderate strength interrelationship between different success factors in housing construction industry in Ukraine each factor with a medium correlation coefficient with at least one of other factors (Appendix 6) will be analyzed. In order to increase reliability of these findings ‘practical significance’ of the correlation coefficients will be examined as well [Hair et al., 2007]. Therefore only meaningful findings will be considered.

**Project manager’s experience:**

<table>
<thead>
<tr>
<th></th>
<th>Decision making abilities</th>
<th>Client’s type and size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project manager’s experience</td>
<td>0.56</td>
<td>0.55</td>
</tr>
</tbody>
</table>

Table 4.6. Project manager’s experience interrelationship
Project manager being one of the key players of every project is very likely to influence project success. However according to Chua et al. (1999) experience of project manager might have the highest impact on project deliverables. According to the data obtained (Table 4.6.) this success factor have the highest moderate correlation coefficient with two other factors which might be an indicator of their interdependence.

Project manager’s experience is correlating with decision making abilities and characteristics of the project client such as type and size. This finding is supported by Walker and Vines (2000) and Belout (1998) who argues that effectiveness of decision making process is dependent on manager’s experience. On the other hand decision making abilities might be considered as project managers soft skills which are developing depending on experience (Gardiner, 2005).

Medium correlation coefficient between experience and client’s size and type is more difficult to understand. On one hand experience of respondents varies from 2 to more than 8 years (Table 4.1.). On the other hand majority of respondents worked with one type of client during their last project (Appendix 5). Therefore it is likely that characteristics of Ukrainian housing construction industry supports the project capability maturity model (Gardiner, 2005) which presents the relationship between manager’s experience and difficulty of projects s/he can manage.

However some authors argue that project manager’s experience is strongly related to such factors like project planning and project monitoring/control (Jaselkis and Ashley, 1991 and Belassi and Tukel, 1996). This interdependence was not supported by current research. Both of the factors show very low correlation with manager’s experience (coefficient equal to 0.16, see Appendix 6).

**Monitoring and control:**

<table>
<thead>
<tr>
<th>Monitoring and control</th>
<th>Client’s type and size</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>0.52</strong></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7. Client’s type and size interrelationship

Project monitoring and control also moderately correlates with client’s type and size project monitoring and control (Table 4.7.). However, as well as in the case above this linkage can not be interpreted in a single way.

It might support the trend of increasing difficulties in construction industry of Ukraine basing on the type of client (government or commercial). According to IBRD report (2007) situation in housing construction industry in Ukraine became significantly worse in this area comparing to previous years. Therefore it could influence the respondents’ perception of these two categories.

However it is quite surprising that no interrelationship was found between such parameters as project scope or change management and monitoring and control. Possibility of mutual dependence of these factors is widely discussed in the literature (Walker, 1995; Akinsola et al., 1997; Songer and Molenaar, 1997; Belout 1998; Chua et al., 1999). Therefore it might be interested to study this success factor more precisely, perhaps on a bigger sample, in order to fully understand its relationship with others.
Client’s knowledge and experience:

<table>
<thead>
<tr>
<th>Qualification of project team</th>
<th>Change management</th>
<th>User involvement</th>
<th>Project scope/size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Client’s knowledge and experience</td>
<td>0.49</td>
<td>0.49</td>
<td>0.46</td>
</tr>
</tbody>
</table>

Table 4.8. Client’s knowledge and experience interrelationship

This group of success factors highlights both well discussed in the literature interrelated determinants of project success and some unique for Ukraine trends which were not addressed before (Table 4.8.).

Having the lowest correlation coefficient in this group relationship between project size/scope and client’s knowledge and experience might be a very interesting one. Client’s type and size does not significantly correlate with project size/scope. Therefore it might be concluded that project scope have a greater impact on project success depending on client’s knowledge and experience rather than on client’s size. It is likely that experienced clients are capable to participate in bigger projects. An experienced client might significantly increase the probability of project success due to its interrelationship with other success factors. This fact is also supported by many researchers in project management area.

Thus, Turner (1999) presented backward approach which is supporting end users’ involvement in the project for achieving project’s objectives in the most efficient way. It is argued by the authors that only experienced clients can handle this approach. However involvement of the end user in the project implementation process might dramatically increase the amount of changes throughout the project life cycle. It leads us to the second relationship in this group between client’s experience and change management. Songer and Molenaar (1997) emphasize that only knowledgeable clients are cable to introduce changes in the project and not influencing its objectives. The finding of current study support this by comparatively strong relationship between clients’s experience and change management in their contribution to project success.

Moreover present research is likely to develop this question more in depth. Qualification of project team was mentioned neither in Songer and Molenaar’s (1997) nor in Turner’s (1999) works. Other researchers who studied the same area like Wateridge (1995) did not touch this question either. However it seems likely that in order to meet all user requirements and introduce effective change management to the project qualification of project team is as important as qualification of client. The trend described by Songer and Molenaar (1997) might be continued to extend of the project team. It is unlikely that inexperienced team will be able to effectively implement changes in the project regardless of the client’s knowledge and capabilities.
Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

Contractors’ competences:

<table>
<thead>
<tr>
<th></th>
<th>Technical and technological</th>
<th>Communication</th>
<th>User involvement</th>
<th>Top management support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractors’ competences</td>
<td>0.52</td>
<td>0.49</td>
<td>0.42</td>
<td>0.42</td>
</tr>
</tbody>
</table>

Table 4.9. Contractors’ competences interrelationship

One of the authors who studied relationship of contractors’ competences with other factors in their contribution to project success was Acharva and Lee (2005). Authors particularly stress on the importance of contractors’ flexibility as one of key competences drivers without which achieving project success ‘seems impossible’. Findings of current survey presented in Table 4.9. support their study and highlight several other interrelationship of this important for housing construction project success factor. As it was mentioned earlier user involvement might drive to numerous changes (Turner, 1999; Songer and Molenaar, 1997) on the other hand top management involvement (or absence of such) might introduce a lot of deviation as well. Both of these factors might require flexibility from project participants and it seems likely that highly competent subcontractors will be more capable to achieve success in such circumstances.

In addition having a very strong association strength with social environmental characteristics which was already discussed above this factor is moderately correlating with technical parameters as well. This situation might be explained by a growing demand on balanced soft and hard competences of project participants (Gardiner, 2005). Technology is very often seen as the main source of unique competences which help companies to explore new markets (Johnson et al, 2008). Therefore situation in Ukrainian construction industry does not differ considerably. Contractors which have the most efficient equipment or special know how are likely to be considered competent and influence considerably on achieving overall project objectives.

However up to date hard skills is not the only requirement to competent contractor. Correlation coefficient of 0.49 between communication and contractors’ competences indicates a moderate interdependence of these success factors. Moreover 23% contractors’ competences is characterized by communication channels ($R^2=0.227$). Such a high percentage might be explained by extreme importance of communication in coordinating subcontractors’ activities with other stakeholders, like project team, other subcontractors or client. Many authors highlighted the extreme importance of communication and coordination of subcontractors for project success (Wikforss and Löfgren, 2007). This study supports this approach since communication seems to contribute to contractors’ competences in their common influence on project success.

Tendering:

<table>
<thead>
<tr>
<th></th>
<th>User involvement</th>
<th>Procurement</th>
<th>Top management support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tendering</td>
<td>0.51</td>
<td>0.48</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Table 4.10. Tendering interrelationship
Both being part of one group of success factors procurement and tendering have a moderate strength of association (Table 4.10.). It seems logical since one factor is a significant part of the other. However in this case the finding highlights the interdependence of these to parameters in their influence on project success. It might be concluded that if procurement factor influence considerably on overall project performance tendering parameter should not be left unattained.

In addition these findings support the study of Carey (1998) about lump sum project budding process. Among the variables which influence process effectiveness such factors as user alignment, flexibility and decision making authority we mentioned. In case of tendering in housing construction projects in Ukraine these parameters seems to be important as well. End user involvement is very likely to align the requirements to the bidding object and increase the efficiency of the process. On the other hand top management support of the project team will increase their authority in decision making and make the overall process more flexible.

4.4.3. Success factors which appeared to have insignificant correlation

Majority of correlation coefficients between success factors in housing construction industry in Ukraine appeared to be low (Appendix 6). Some success factors like project type or clear project objectives did not have any high or moderate correlation with other factors.

However many researchers argue that some of the success factors which did not appear to have association strength in current study are closely interrelated. Akinsola et al. (1997) states that project type and complexity will influence planning and monitoring processes. Belout (1998) supports him by referring to project size as one of the main drivers of further managerial approaches choice.

These contradictions might have several reasons. First of all current study focuses on linear relationship of success factors interdependence and does not take into consideration other types of relationship. Secondly it focuses on Ukrainian market only which might be considerably different from other geographical regions. Thirdly, the sample used to conduct current survey if increased in size and reliability might provide different results and depict different groups of correlated factors. Therefore all these perspectives could be important for further research the possibilities of which are going to be discussed in a separate section.

4.4.4. 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 Ukraine.

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. Three groups of success factors appear to be highly correlated among themselves supported by another 14 groups with a moderate strength of association that might be practically interpreted. Therefore, it might
be concluded that a complex system of interrelationship between the dependent variable of project success and independent variables of success factors exist.

Dominance of human resources 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 theory of lack of professionals in the construction industry in Ukraine (Enterprise survey, 2008). Demand for competent and experienced personal continue to considerably exceed supply. This situation increases the importance of human resources group since in addition to its direct strong influence on project success it influence other drivers as well.

Environmental group of factors appear to have second highest amount of correlations with two factors from the group itself having high interrelation among them. This might be a clear indicator of high importance of changing external environment for complex long term project like housing construction. Managerial implications of this finding will be discussed in the conclusion chapter.

Overall if analyzing the interrelation map from the group of factors perspective it clearly shows the dramatic preponderance of factors related to the primary project success area. These factors appear to have five times higher amount of correlation links with other factors comparing to factors from supporting project success area. This might be another supporting argument of their high influence on project success.
5. Conclusions and managerial implications

The current section presents the conclusion of the research project followed by limitations of the study and suggestions for further research for an interested reader. The aim of this section is to provide a summary of data findings as a theoretical contribution to project management body of knowledge followed by some practical considerations about findings applicability.

5.1. Summary of the findings

A questionnaire based survey investigated the main drivers of housing construction project success in Ukraine 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 Ukraine success factors.*

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 broaden 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:

<table>
<thead>
<tr>
<th>Primary project success area (higher significance for project success)</th>
<th>Supporting project success area (lower significance for project success)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- project management, - human resources - environmental characteristics</td>
<td>- procurement - corporate management - project characteristics</td>
</tr>
</tbody>
</table>

Based on the analysis of the significance of each group for overall project success the study shifts it focus to primary project success area and single factors which form this groups and on their impact on project success. A ranking table reflects the list of success
factors relevant for Ukrainian housing construction industry according to their impact presented in a descending order.

Separate analysis of groups in the primary area helped to identify the most influential individual success factors. Contribution of these factors to overall project success seems to drive the importance of the groups these factors belong to.

Moreover combination of findings regarding groups of factors with single factor analysis might be combined in a general framework (Figure 5.1.). This framework completely answers the first research question and might be used as a roadmap for achieving project success in housing construction projects in Ukraine.

Research question 2:

*Identification of possible interrelations between success factors in housing construction projects in Ukraine.*
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:
- team spirit and communication
- political and economical characteristics
- contractor’s competences and social characteristics

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 analysis of single factors which moderately influenced other drivers of project success. 14 different pairs of factors were considered being statistically and practically relevant. The following factors had the highest number of moderate correlation with other parameters:
- project manager’s knowledge and experience
- client’s knowledge and experience
- contractor’s competences
- tendering

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 5.1.). 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.

<table>
<thead>
<tr>
<th>Type of success factor area</th>
<th>Amount of strong and moderate interrelations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary area</td>
<td>14</td>
</tr>
<tr>
<td>Supporting area</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 5.1. Interrelation spread between success factor areas

5.2. Managerial implications

The findings and conclusions of current study highlight a number of important issues related to housing construction industry in Ukraine. This information might be of particular interest both for the companies which already operate on the market 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.
Importance of project managers’ soft and hard skills

Planning, monitoring and control, communication and managers’ decision making abilities were considered as the most important group of factors for achieving project success in housing construction industry in Ukraine. By finding the biggest determinant of project success the outcome of this study might serve as guide for Ukrainian construction companies who wishes to improve their project performance in efficient way.

These findings might be taken for consideration when allocating limited resources for personal training and development. Among all the listed factors the impact of planning and monitoring abilities of project manager is 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.

High weight of soft and hard skills in project success is also supported by the fact that human factors like project manager’s experience, competence and leadership as well as qualification of project team appeared to be other drivers of performance identified by the study.

These findings support the current trend in world economy of human resources’ knowledge and expertise becoming main intangible assets of majority of organization. This trend seems likely to appear in housing construction industry in Ukraine. Even though being highly dependable on current level of technology the influence of human resources characteristics is considerably higher in this industry.

Importance of management of external project environmental

This study confirms the importance of external environment for project success in Ukraine. Unfortunately these findings are unlikely to be generalized to post USSR countries level or Eastern Europe. However it might be a clear indicator for companies who operate on Ukrainian market or plan to expand to it.

Extremely high influence of external environment characteristics on project performance is very likely to significantly increase the level of risk associated with the project. Since managers are not capable to influence these parameters directly and adjust them to project needs project risk management gains particular important.

When unpredictable and turbulent external environment might have a significant impact on project performance static analytical tools like PESTEL or SWOT analysis might have significant disadvantages. Dynamic project risk analysis and management process (PMBoK) might be a more effective technique in this case.

Project managers might consider these findings particularly useful when dealing with such issues like project insurance, risk allocation or project contingency planning.

Interrelation of the success factors

Another application of the study beside the identification of the most important success factors is performance of interrelation analysis between them. Be 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 desire 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.
6. Research limitations

This section highlights the drawbacks of current study and specifies to which extend it might be applicable in project management knowledge area. Two main drivers of this research are scope of study and methodology applied. The sections below describe different limitations in more details.

Main focus on housing construction projects in one specific country

While being focused on specific type of projects in one country the research is not able to provide generalization regarding construction industry as a whole or region/type of economy, i.e. developing economies. This might be the main limitation of this study since the conclusions can not be applied to other countries in the region or provide information concerning success factors of project management in Ukraine. This limitation could be addressed by conducting further research in this area. The next section ‘Recommendation for further research’ explores this area in depth.

Biased sample

Sampling procedure of this research has a number of biases which from statisticians’ point of view questions the quality of this research. The managers who participated in the survey were contacted through the existing web portals and construction companies databases. This introduces on of the biases since we were able to reach only the managers who have a subscription to the mentioned above sources. However other housing construction project managers were not contacted.

Moreover even though significant amount of responses were received the assumptions of central limit theorem (Berenson et al., 2002) were not met. 26 responses is slightly less than 30 nevertheless the assumption about normal distribution of the sample might be arguable.

Therefore, basing on statistical principals, it might be doubtful to generalize findings of this research to extend of housing construction industry as a whole. However, from the practical point of view this increases the quality of research. The web portals and databases are mainly used by established companies which employ experienced project managers. This helped to increase the quality of survey since the respondents had the required level of knowledge in order to answer the questions.

Second bias regarding the sample as mentioned by Ticehurst and Veal (1999) as unavoidable when conducting a mail questionnaire is ‘self selected’ sample. Random sample is not possible in this situation since the researches can evaluate only completed by respondents forms. This research approaches the limitation by using the framework developed by Ticehurst and Veal (1999) to maximizing the response rate as well by increasing the initial sample size.

Sample representativeness

Even though sample representativeness was addressed in a coherent way by distributing the questionnaire to a wide range of companies in terms of geographical location, age, number of completed projects and other characteristics it is still possible to question weather this sample can represent the housing construction industry of Ukraine. First of all, any sample can not precisely describe all the features of entire population. Secondly, there is always a probability to receive ‘uninformed response’ (Saunders, et al., 2000) which are
questionnaires filled in not by managers themselves but by their assistants or other managers in the company who are not competent in the area.

This research addresses the first issue by accepting the 5 percent degree of freedom (\( \alpha =0.05 \)). The second issue was controlled by performing a refinery based on the extension of the e-mails. As already was mentioned e-mails with extensions like info@xxx or office@xxx were excluded from the mailing list.

**Data analysis technique**

Current research employs different tools and techniques of descriptive statistics as well as basic correlation analysis for studying interrelationship between the different success factors. These tools were considered the most appropriate for answering the research question and analysis of the amount of data collected with the questionnaire (26 responses).

However if the time for the research project could be extended it seems likely that more data might be collected. After increasing the number of responses a deeper analysis of the research area via implementation of more sophisticated statistical tools might be done.

For example, simple factor analysis (Hair *et al.*, 1998) is used to study the division of success factors in different groups. In current research factor analysis was completed from literature review. However a statistical tool could have been used to check these findings.

In addition bigger array of data could form a basis for multiple regression model. This model might be able to describe in statistical terms the relationship between different success factors and their impact on project success (Hair *et al.*, 1998).
7. Recommendations for further research

This section provides a brief overview of both possibilities of improving current study and carrying out research in different areas in order to add knowledge to the project management theory.

Generalizing to country level

The overview of existing literature identified a lack of research in the area of construction industry in Ukraine. Therefore further investigation might be done considering different types of projects like research and development projects or civil engineering construction projects and comparing the results with conclusion of this study. Developing the knowledge area in this direction it might become possible to generalize to peculiarities of project success factors in Ukraine as a country.

Seeing success factors via cultural lens/ life cycle lens

Another approach to develop this research to a higher level might be carrying out similar research in different countries in the region or worldwide. The potential of this direction is studying project success factors via the cultural lens. If sufficient amount of research will be carried out in this area one of the next steps could be project success factors cultural framework development. The contribution of such a framework might be explanation of different approaches to project success depending on the country or region.

In addition the same research approach might be adapted to studying success factors from the perspective of project life cycle. This research could focus on identification of different success factors regarding the stage of project development.

Studying the industry in depth

In addition current research might be developed by increasing the sample size and studying the area more in depth by deploying different methodology. Increasing the sample size could help to identify more precisely the interrelation framework of success factors. In addition different research methodology like semi-structured interviews or case studies might be carried out in a sufficient number of companies to be statistically eligible to generalize to industry level. This can provide a significant contribution to the existing literature by adding knowledge to the project management theory in developing economies.
List of References:


Success Factors in Construction Projects: A Study of Housing Projects in Ukraine


IEEE Std (no date) The world leading professional association for the advancement of technology retrieved on 13 November 2008 via http://www.projectsmart.co.uk/pmbok.html


Success Factors in Construction Projects: A Study of Housing Projects in Ukraine


Liu A. (1999) ‘A research model of project complexity and goal commitment effects on project outcome’ Engineering, Construction and Architectural Management vol. 6, issue 2, p. 105-111


Success Factors in Construction Projects: A Study of Housing Projects in Ukraine


Rockart J. (1979) ‘Chief executives define their own data needs’ Harvard Business Review Murch-April, p. 81-93


Success Factors in Construction Projects: A Study of Housing Projects in Ukraine


USCS (no date) Ukrainian State Committee of Statistic retrieved on 16 November 2008 via www.ukrstat.gov.ua


Appendices

Appendix 1: Coding of the Research model

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$X_{11}$</td>
<td>Success factors related to project characteristics: type of the project</td>
</tr>
<tr>
<td>$X_{12}$</td>
<td>project scope/ size</td>
</tr>
<tr>
<td>$X_{13}$</td>
<td>clear objectives of project</td>
</tr>
<tr>
<td>$X_{21}$</td>
<td>Success factors related to project management: proper planning/ scheduling</td>
</tr>
<tr>
<td>$X_{22}$</td>
<td>monitoring/ control</td>
</tr>
<tr>
<td>$X_{23}$</td>
<td>communication</td>
</tr>
<tr>
<td>$X_{24}$</td>
<td>decision making abilities</td>
</tr>
<tr>
<td>$X_{31}$</td>
<td>Success factors related to people: PM’s competence/leadership</td>
</tr>
<tr>
<td>$X_{32}$</td>
<td>PM’s experience</td>
</tr>
<tr>
<td>$X_{33}$</td>
<td>PM’s authority</td>
</tr>
<tr>
<td>$X_{34}$</td>
<td>qualification of project team</td>
</tr>
<tr>
<td>$X_{35}$</td>
<td>client’s type, size</td>
</tr>
<tr>
<td>$X_{36}$</td>
<td>client’s knowledge and experience</td>
</tr>
<tr>
<td>$X_{37}$</td>
<td>contractors’ competence</td>
</tr>
<tr>
<td>$X_{38}$</td>
<td>relations with sponsor/ project champion</td>
</tr>
<tr>
<td>$X_{39}$</td>
<td>user involvement</td>
</tr>
<tr>
<td>$X_{310}$</td>
<td>team spirit between project key players</td>
</tr>
<tr>
<td>$X_{41}$</td>
<td>Success factors related to general management and organization top management support</td>
</tr>
<tr>
<td>$X_{42}$</td>
<td>change management</td>
</tr>
<tr>
<td>$X_{43}$</td>
<td>organizational structure</td>
</tr>
<tr>
<td>$X_{51}$</td>
<td>Success factors related to procurement: purchasing</td>
</tr>
<tr>
<td>$X_{52}$</td>
<td>tendering</td>
</tr>
<tr>
<td>$X_{61}$</td>
<td>Success factors related to environment: social environment</td>
</tr>
<tr>
<td>$X_{62}$</td>
<td>political environment</td>
</tr>
<tr>
<td>$X_{63}$</td>
<td>economic environment</td>
</tr>
<tr>
<td>$X_{64}$</td>
<td>technical and technological environment</td>
</tr>
<tr>
<td>$Y$</td>
<td>Project Success</td>
</tr>
</tbody>
</table>
Appendix 2: Semi-structured interviews question guide

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 were you 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 makes a 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 a 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.
### Appendix 3: Summary of semi-structured interviews

<table>
<thead>
<tr>
<th>Questions</th>
<th>Respondent 1</th>
<th>Respondent 2</th>
<th>Respondent 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.a</td>
<td>Project manager</td>
<td>Project director</td>
<td>Director/ owner</td>
</tr>
<tr>
<td>1.b</td>
<td>Lead projects</td>
<td>Lead projects</td>
<td>Business development</td>
</tr>
<tr>
<td>1.c</td>
<td>Government constructions</td>
<td>No project management experience</td>
<td>First business</td>
</tr>
<tr>
<td>1.d</td>
<td>Commercial units</td>
<td>Commercial units</td>
<td>Private sector</td>
</tr>
<tr>
<td>2.a</td>
<td>Housing</td>
<td>Housing</td>
<td>Cottages</td>
</tr>
<tr>
<td>2.b</td>
<td>People, professionals</td>
<td>communication; commitment to project goal</td>
<td>Negotiation, flexibility</td>
</tr>
<tr>
<td>2.c</td>
<td>Budget-yes, time-no</td>
<td>Almost (excluding budget)</td>
<td>yes</td>
</tr>
<tr>
<td>2.d</td>
<td>Yes. Success due to: stakeholders’ satisfaction (perfect networking), economic &amp; political factors (positively affected investments)</td>
<td>Yes. Success due to: detailed planning, new technologies; communication</td>
<td>Yes. Success due to: constant user involvement, flexible management and communication</td>
</tr>
<tr>
<td>3.a</td>
<td>Important</td>
<td>Average</td>
<td>Average</td>
</tr>
<tr>
<td>3.b</td>
<td>Important</td>
<td>Very important (plan and control)</td>
<td>Very important (plan)</td>
</tr>
<tr>
<td>3.c</td>
<td>Very important (contractors, client)</td>
<td>Important</td>
<td>Very important (user, communication)</td>
</tr>
<tr>
<td>3.d</td>
<td>Average</td>
<td>Average</td>
<td>Not important</td>
</tr>
<tr>
<td>3.e</td>
<td>Average</td>
<td>Important</td>
<td>Average</td>
</tr>
<tr>
<td>3.f</td>
<td>Very important (economic). Insurance is important.</td>
<td>Very important (technology)</td>
<td>Important (economic: credit policy)</td>
</tr>
<tr>
<td>4</td>
<td>- no need to ask about region of operations since all the companies are quite mobile</td>
<td>- decision making ability success factor is not clear</td>
<td>- decision making ability success factor is interpreted as part of PM competences</td>
</tr>
<tr>
<td></td>
<td>- suggested to change translation of PM authority success factor</td>
<td>- translation of leadership interpreted as delegation</td>
<td>- bureaucracy suggested as additional success factor</td>
</tr>
</tbody>
</table>
Appendix 4: Questionnaire design

a) Summary of Cover Letter

Dear Respondent,

We request your participation and support our research on “Success Factors in Construction Projects in Ukraine” undertaken as a part of Master Thesis at Umea School of Business, Sweden.

The focus of current research is on success factors of housing construction industry in Ukraine. The aim of this questionnaire is to identify the most important levers which influence housing construction project success all over Ukraine. This research is being conducted by Ivan Konovets and Inna Didenko as a part of requirement for completion a Master Course in Umea Business School (January 2009) and under supervision of Tomas Blomquist. Your input as experienced professional in area of construction project management is highly appreciated.

Please follow the link to complete the questionnaire:
http://spreadsheets.google.com/viewform?key=pT_ZBxgdtv39vXLhFwWlMCg

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.

Participation in this research is entirely voluntarily and there is no penalty if you do not participate. There is no risk associated with filling in the questionnaire since anonymity of the answers is guaranteed by researchers. E-mail information will be used to track the number of responses only and will not be shared with anybody outside the research group.

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.

Should you have any questions regarding completing the questionnaire or about participation in this study please do not hesitate to contact us at ivse0002@student.umu.se or impa0008@student.umu.se

Thank you for your time and concern.

Please follow the link to complete the questionnaire:
http://spreadsheets.google.com/viewform?key=pT_ZBxgdtv39vXLhFwWlMCg

Sincerely,

Inna Didenko and Ivan Konovets,
Master students, USBE
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 to 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 2 3 4 5
   significantly less than others as other firms significantly more than others

4. What was the budget of your last project (in US Dollars)_______________

   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) Ukraine wide
   c) specific region in Ukraine

7. My company’s size in terms of number of employees (including subcontractors):
   a) less than 200
   b) 200-500
   c) 500-2000
   d) 2000-4000
   d) more than 4000

5. The main clients of my last project was:
   a) government
   b) commercial/business
   c) both
   d) other (please specify): ____________

6. 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

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

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.

<table>
<thead>
<tr>
<th>Factors leading to project success</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>success factors related to project characteristics:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- type of the project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- project scope/ size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- clear objectives of project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>success factors related to project management:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- proper planning/ scheduling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- monitoring/ control</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- communication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- decision making abilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>success factors related to people:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- PM’s competence/leadership</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- PM’s experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- PM’s authority</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- qualification of project team</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- client’s type, size</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- client’s knowledge and experience</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- contractors’ competence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- relations with sponsor/ project champion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- user involvement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- team spirit between project key players</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>success factors related to general management and organization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- top management support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- change management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- organizational structure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>success factors related to procurement:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- purchasing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- tendering</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>success factors related to environment:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- social environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- political environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- economic environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- technical and technological environment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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: __________________________________________
____________________________________________________

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

<table>
<thead>
<tr>
<th>Groups of success factors</th>
<th>Contribution to project success</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success factors related to project characteristics</td>
<td></td>
</tr>
<tr>
<td>Success factors related to project management</td>
<td></td>
</tr>
<tr>
<td>Success factors related to people</td>
<td></td>
</tr>
<tr>
<td>Success factors related to general management and organization</td>
<td></td>
</tr>
<tr>
<td>Success factors related to procurement</td>
<td></td>
</tr>
<tr>
<td>Success factors related to environment</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

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
c) Actual layout of questionnaire in Google Forms®

Исследование факторов успеха жилого строительства в Украине

Уважаемые Дамы и Господа,

Пожалуйста заполните данную форму. Опрос займет не более 15 минут.

Спасибо за сотрудничество!

"Обязательно"

Название моей текущей должности:

Насколько успешным был Ваш последний проект по сравнению с другими проектами в Вашей компании, рассматривая время необходимое на его завершение:

1 2 3 4 5
абсолютный провал ☐ ☐ ☐ ☐ ☐ блестящий успех

Насколько успешным был Ваш последний проект по сравнению с другими проектами в Вашей компании, рассматривая завершение проекта в рамках бюджета:

1 2 3 4 5
абсолютный провал ☐ ☐ ☐ ☐ ☐ блестящий успех

Насколько успешным был Ваш последний проект по сравнению с другими проектами в Вашей компании, рассматривая завершение проекта согласно требованиям по качеству:

1 2 3 4 5
абсолютный провал ☐ ☐ ☐ ☐ ☐ блестящий успех

Насколько успешным был Ваш последний проект по сравнению с другими проектами в Вашей компании, рассматривая удовлетворение интересов всех участников проекта:

1 2 3 4 5
абсолютный провал ☐ ☐ ☐ ☐ ☐ блестящий успех

Насколько успешным был Ваш последний проект по сравнению с другими проектами в Вашей компании, рассматривая достижение запланированных целей проекта:

1 2 3 4 5
абсолютный провал ☐ ☐ ☐ ☐ ☐ блестящий успех

Насколько прибыльным был Ваш последний проект по сравнению со схожими проектами в компании:

1 2 3 4 5
значительно менее прибыльным ☐ ☐ ☐ ☐ ☐ значительно более прибыльным

Бюджет моего последнего проекта составил:

Пожалуйста, укажите сумму в Долларах США
Мой опыт работы в строительстве:
Пожалуйста, укажите только опыт на управленческих позициях
○ менее 2-х лет
○ 2-5 года
○ 5-7 лет
○ Более 8 лет

Зона деятельности моей компании:
○ По всему миру
○ На Украине
○ В регионе в Украине

Размер моей компании по количеству сотрудников:
○ менее 200 человек
○ 200-500 человек
○ 500-2000 человек
○ 2000-4000 человек
○ Более 4000 человек

Основной клиент моей компании это:
○ Государство и государственные структуры
○ Коммерческие структуры и частные лица
○ Оба варианта
○ Другое:

Мой последний проект был в сфере:
○ Гражданское строительство (жилая и коммерческая недвижимость)
○ Инженерное строительство (мосты, дороги и т.д.)
○ Промышленное строительство (заводы, фабрики и т.д.)
○ Другое:

Пожалуйста, опишите что по Вашему мнению делает проект успешным

Пожалуйста, опишите проект который считали успешным в Вашей компании и почему он был успешным
### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Тип проекту

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Масштаб проекта

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Четкі ціли проекта

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Детальне планування

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Моніторинг і керівництво

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Комунікаційні каналі

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Способність/змістовність приймати рішення

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Навички і лідерські здібності проектного менеджера

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Опіт проектного менеджера

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### Прорахійте вплив даного фактора на успіх Вашого посліднього проекту:
#### Уровень впливу проектного менеджера

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>абсолютно неважливо</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
### Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

<table>
<thead>
<tr>
<th>Factor</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience of the project team</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type and size of the customer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience of the customer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reputation of the sponsor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coherence of the system</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Support for the project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management of changes in the project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational structure of the company</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Importance of the factor for success of the last project</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Управленческий фактор

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Проведение тендера

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Социальный фактор

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Политический фактор

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Экономический фактор

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Проранжируйте влияние данного фактора на успех Вашего последнего проекта:

Технический и технологический факторы

1 2 3 4 5
абсолютно неважен   ○ ○ ○ ○ ○ чрезвычайно важен

Если Вы считаете важным фактор, отсутствующий в приведенном выше списке, пожалуйста, укажите его с соответствующей оценкой:

Если у Вас есть комментарии, касающиеся списка факторов, предложенного выше, пожалуйста, оставьте их здесь:

Пожалуйста, присвойте процентный вес каждой неназванной группе факторов, основываясь на степени их влияния на успех проекта (сумма процентов, распределенных между группами должна быть равной 100%).

Группа 1. Факторы, относящиеся к характеристикам проекта

Группа 2. Факторы, относящиеся к проектному управлению (необходимо)

Группа 3. Факторы, относящиеся к человеческим ресурсам

Группа 4. Факторы, относящиеся к организации и неоднозначно в компании

97
Группа 5. Факторы, относящиеся к управлению запуском

Группа 6. Факторы, относящиеся к внешней среде проекта

Хотели бы Вы получить сводные результаты этого исследования
Да, пожалуйста

Если да, пожалуйста, предоставьте действующий эл. адрес

Отправить

На основе Документа Google
Условия предоставления услуги - Дополнительные условия
### Appendix 5: Data collected by questionnaire (responses spreadsheet).

<table>
<thead>
<tr>
<th>Code of respondent</th>
<th>The title of my current job position</th>
<th>How successful was your last project comparing to other projects in your company in terms of:</th>
<th>Time required for project completion</th>
<th>Delivering the project within budget</th>
<th>Delivering the project quality requirements</th>
<th>Achieving stakeholders satisfaction</th>
<th>Achieving project purpose</th>
<th>How profitable was your last project comparing to others (similar type) in the company:</th>
<th>What was the budget of your last project (in US Dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Project Director</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>10000000</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Manager</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>30000000</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Executive Director</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>15000000</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Project Manager</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>35000000</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Project Director</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>25000000</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Manager</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>12000000</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Director/Owner</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>50000000</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Project Manager</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>25000000</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Project Manager</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>12000000</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Project Coordinator</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>30000000</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Project Manager</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>40000000</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Director</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>15000000</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Project Leader</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>40000000</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Executive Director</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>10000000</td>
</tr>
<tr>
<td>15</td>
<td>Project Leader</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>50000000</td>
</tr>
<tr>
<td>16</td>
<td>Director</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>10000000</td>
</tr>
<tr>
<td>17</td>
<td>Senior Manager of Project Department</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>Executive Director</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>Manager</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>Project Manager</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>Project Manager</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>22</td>
<td>Director of Project Department</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>23</td>
<td>Department Director</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>24</td>
<td>Project Coordinator</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>25</td>
<td>Project Coordinator</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>26</td>
<td>Director</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>
### Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

<table>
<thead>
<tr>
<th>Code of respondent</th>
<th>My work experience in industry (managerial position) is:</th>
<th>My company's scope of operations:</th>
<th>My company's size in terms of number of employees (including site workers and subcontractors):</th>
<th>The main clients of my last project was:</th>
<th>The type of my last projects was:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>2</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>200-500 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>3</td>
<td>2-4 years</td>
<td>Ukraine wide</td>
<td>less than 200 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>4</td>
<td>2-4 years</td>
<td>specific region in Ukraine</td>
<td>less than 200 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>5</td>
<td>5-7 years</td>
<td>specific region in Ukraine</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>6</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>less than 200 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>7</td>
<td>2-4 years</td>
<td>specific region in Ukraine</td>
<td>less than 200 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>8</td>
<td>2-4 years</td>
<td>Ukraine wide</td>
<td>200-500 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>9</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>10</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>11</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>more than 4000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>12</td>
<td>2-4 years</td>
<td>specific region in Ukraine</td>
<td>less than 200 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>13</td>
<td>less than 2- x years</td>
<td>specific region in Ukraine</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>14</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>more than 4000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>15</td>
<td>2-4 years</td>
<td>specific region in Ukraine</td>
<td>200-500 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>16</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>500-2000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>17</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>both</td>
<td>Housing areas and infrastructure</td>
</tr>
<tr>
<td>18</td>
<td>2-4 years</td>
<td>World wide</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>19</td>
<td>less than 2- x years</td>
<td>specific region in Ukraine</td>
<td>200-500 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>20</td>
<td>2-4 years</td>
<td>specific region in Ukraine</td>
<td>200-500 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>21</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>government</td>
<td>housing construction</td>
</tr>
<tr>
<td>22</td>
<td>5-7 years</td>
<td>specific region in Ukraine</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>23</td>
<td>more than 8 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>both</td>
<td>housing construction</td>
</tr>
<tr>
<td>24</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>25</td>
<td>5-7 years</td>
<td>Ukraine wide</td>
<td>2000-4000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
<tr>
<td>26</td>
<td>5-7 years</td>
<td>specific region in Ukraine</td>
<td>500-2000 people</td>
<td>commercial/business</td>
<td>housing construction</td>
</tr>
</tbody>
</table>
| Code of respondent | Human recourses | Project successful: achieving quality objectives and finished in time at
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Human recourses</td>
<td>Construction of residential community (4 blocks of flats, 10-16 stores high) in Kiev. Suitable site location and quick obtaining of all legal documents allowed to complete the project ahead of time and increased its profitability.</td>
</tr>
<tr>
<td>23</td>
<td>Detailed description of projects goals and consecutive actions towards achieving these goals (in time, within budget, according to quality requirements). In addition implication of new technology both in construction and managerial processes.</td>
<td>Construction of recreation center which consisted of 25 cottages with infrastructure in Yalta region. Alignment of subcontractors’ actions helped to complete the project within the time limits. It positively influenced the profitability of the project.</td>
</tr>
<tr>
<td>24</td>
<td>Stable external environment and partnership relationships with the client. Only in this case detailed planning is possible combined with flexibility in decision making. Alignment of project documentation with legal requirements.</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>Human and financial recourses</td>
<td>met client's requirements in terms of time and budget</td>
</tr>
<tr>
<td>26</td>
<td>investment appraisal, project feasibility study</td>
<td></td>
</tr>
</tbody>
</table>
## Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

<table>
<thead>
<tr>
<th>Code of respondent</th>
<th>type of the project</th>
<th>project scope/size</th>
<th>clear objectives of project</th>
<th>proper planning/scheduling</th>
<th>communication</th>
<th>decision making abilities</th>
<th>PM's competence/leadership</th>
<th>PM's experience</th>
<th>PM's authority</th>
<th>client’s type, size</th>
<th>client’s knowledge and experience</th>
<th>contractors’ competence</th>
<th>relations with sponsor/project champion</th>
<th>user involvement</th>
<th>team spirit between project key players</th>
<th>top management support</th>
<th>change management</th>
<th>organizational structure</th>
<th>procurement</th>
<th>tendering</th>
<th>social</th>
<th>political</th>
<th>economic</th>
<th>technical and technological</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>7</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>9</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>13</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>14</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>17</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>18</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>19</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>21</td>
<td>2</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>22</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>23</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>24</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>25</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
### Success Factors in Construction Projects: A Study of Housing Projects in Ukraine

<table>
<thead>
<tr>
<th>Code of respondent</th>
<th>Any success factor not mentioned above which you consider important:</th>
<th>Success factors related to project characteristics</th>
<th>Success factors related to project management</th>
<th>Success factors related to people</th>
<th>Success factors related to general management and organization</th>
<th>Success factors related to procurement</th>
<th>Success factors related to environment</th>
<th>Would you like a summary of this study to be sent to you after it will be completed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>beurocracy (5)</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>25</td>
<td>No, thank you</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>10</td>
<td>30</td>
<td>No, thank you</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>15</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>5</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>35</td>
<td>No, thank you</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>5</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>30</td>
<td>No, thank you</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>15</td>
<td>20</td>
<td>40</td>
<td>5</td>
<td>5</td>
<td>15</td>
<td>No, thank you</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>20</td>
<td>30</td>
<td>10</td>
<td>15</td>
<td>5</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>15</td>
<td>30</td>
<td>15</td>
<td>5</td>
<td>15</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>10</td>
<td></td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>No, thank you</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>5</td>
<td>15</td>
<td>30</td>
<td>15</td>
<td>5</td>
<td>30</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>12</td>
<td></td>
<td>5</td>
<td>40</td>
<td>20</td>
<td>5</td>
<td>20</td>
<td>10</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>10</td>
<td>15</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>5</td>
<td>30</td>
<td>15</td>
<td>5</td>
<td>20</td>
<td>15</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>15</td>
<td></td>
<td>5</td>
<td>20</td>
<td>30</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>No, thank you</td>
</tr>
<tr>
<td>16</td>
<td></td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>5</td>
<td>5</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>17</td>
<td></td>
<td>10</td>
<td>25</td>
<td>25</td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>18</td>
<td></td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>15</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>19</td>
<td></td>
<td>10</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td>5</td>
<td>15</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>20</td>
<td></td>
<td>10</td>
<td>35</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>21</td>
<td></td>
<td>5</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>40</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>22</td>
<td></td>
<td>20</td>
<td>15</td>
<td>25</td>
<td>15</td>
<td>10</td>
<td>15</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>23</td>
<td></td>
<td>5</td>
<td>30</td>
<td>15</td>
<td>10</td>
<td>20</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td>5</td>
<td>20</td>
<td>30</td>
<td>10</td>
<td>10</td>
<td>25</td>
<td>Yes, thank you</td>
</tr>
<tr>
<td>25</td>
<td>not clear what does decision making abilities factor represents</td>
<td>10</td>
<td>25</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>20</td>
<td>No, thank you</td>
</tr>
<tr>
<td>26</td>
<td>beurocracy (5)</td>
<td>20</td>
<td>30</td>
<td>15</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>No, thank you</td>
</tr>
</tbody>
</table>
### Appendix 6: Highly and moderately correlated success factors

|                                | project scope/ size | proper planning/ scheduling | monitoring/ control | communication | decision making abilities | PM's competence/leadership | PM’s experience | qualification of project team | client’s type, size | client’s knowledge and experience | contractors’ competence | user involvement | team spirit between project key players | top management support | change management | procurement | tendering | social | political | economic | technical and technological |
|--------------------------------|---------------------|-----------------------------|---------------------|---------------|---------------------------|---------------------------|----------------|-----------------------------|-----------------|---------------------------------|------------------------|-----------------|-------------------------------|-------------------|-----------------|----------------|---------------|-------|---------|--------|----------------|---------|
| project scope/ size            | 1                   |                             |                     |               |                           |                           |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| proper planning/ scheduling    | 0.18                | 1                           |                     |               |                           |                           |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| monitoring/ control            | 0.21                | 0.35                        | 1                   |               |                           |                           |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| communication                 | 0.40                | 0.31                        | 0.24                | 1             |                           |                           |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| decision making abilities     | 0.21                | 0.14                        | 0.01                | 0.12          | 1                          |                           |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| PM’s experience               | 0.05                | 0.14                        | 0.15                | 0.08          | 0.09                       | 1                          |                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| qualification of project team | 0.29                | 0.16                        | 0.16                | 0.06          | 0.56                      | 0.27                        | 1                |                             |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| client’s type, size           | 0.39                | 0.05                        | 0.08                | 0.38          | 0.23                      | 0.10                        | 0.08            | 1                          |                 |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| client’s knowledge and experience | 0.26               | 0.32                        | 0.52                | 0.27          | 0.35                      | 0.06                        | 0.55            | 0.17                       | 1              |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| contractors’ competence       | 0.40                | 0.01                        | 0.03                | 0.36          | 0.06                      | 0.31                        | 0.49            | 0.39                       | 1              |                                |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| user involvement              | 0.39                | 0.21                        | 0.06                | 0.48          | 0.05                      | 0.02                        | 0.25            | 0.31                        | 0.05           | 0.19                           |                        |                 |                               |                   |                 |             |             |       |         |        |                |         |
| team spirit between project key players | 0.12               | 0.33                        | 0.00                | 0.11          | 0.06                      | 0.31                        | 0.17            | 0.02                       | 0.40           | 0.46                           | 0.42                    |                 |                               |                   |                 |             |             |       |         |        |                |         |
| top management support        | 0.25                | 0.11                        | 0.15                | 0.77          | 0.06                      | 0.12                        | 0.02            | 0.33                        | 0.31           | 0.38                           | 0.32                    | 0.16            | 1                          |                   |                 |             |             |       |         |        |                |         |
| change management             | 0.44                | 0.18                        | 0.06                | 0.12          | 0.22                      | 0.01                        | 0.05            | 0.15                        | 0.16           | 0.42                           | 0.51                    | 0.07            | 1                          |                   |                 |             |             |       |         |        |                |         |
| procurement                   | 0.01                | 0.44                        | 0.18                | 0.06          | 0.12                      | 0.22                        | 0.01            | 0.05                        | 0.15           | 0.16                           | 0.42                    | 0.16            | 1                          |                   |                 |             |             |       |         |        |                |         |
| tendering                     | 0.30                | 0.01                        | 0.00                | 0.26          | 0.30                      | 0.15                        | 0.07            | 0.06                        | 0.20           | 0.49                           | 0.27                    | 0.24            | 0.01                      | 0.02            | 1             |             |             |       |         |        |                |         |
| social                        | 0.44                | 0.21                        | 0.44                | 0.00          | 0.09                      | 0.21                        | 0.25            | 0.14                        | 0.14           | 0.68                           | 0.32                    | 0.40            | 0.22                      | 0.26            | 0.49          | 1             |             |       |         |        |                |         |
| political                     | 0.23                | 0.02                        | 0.39                | 0.21          | 0.14                      | 0.05                        | 0.10            | 0.03                        | 0.26           | 0.15                           | 0.17                    | 0.38            | 0.19                      | 0.40            | 0.20          | 1             |             |       |         |        |                |         |
| economic                      | 0.28                | 0.39                        | 0.13                | 0.00          | 0.17                      | 0.35                        | 0.14            | 0.11                        | 0.21           | 0.21                           | 0.29                    | 0.51            | 0.01                      | 0.48            | 0.09          | 1             |             |       |         |        |                |         |
| technical and technological   | 0.33                | 0.26                        | 0.44                | 0.00          | 0.09                      | 0.21                        | 0.25            | 0.14                        | 0.14           | 0.68                           | 0.32                    | 0.40            | 0.22                      | 0.26            | 0.49          | 1             |             |       |         |        |                |         |
| economic                      | 0.17                | 0.06                        | 0.25                | 0.21          | 0.24                      | 0.06                        | 0.10            | 0.01                        | 0.26           | 0.20                           | 0.19                    | 0.13            | 0.09                      | 0.19            | 0.25          | 0.21          | 0.25         | 0.32         | 1         |       |         |        |                |         |
| economic                      | 0.04                | 0.04                        | 0.24                | 0.07          | 0.01                      | 0.01                        | 0.16            | 0.19                        | 0.18           | 0.06                           | 0.23                    | 0.17            | 0.15                      | 0.34            | 0.34          | 0.17          | 0.24         | 0.17         | 0.61       | 1       |         |        |                |         |
| economic                      | 0.21                | 0.27                        | 0.40                | 0.20          | 0.07                      | 0.45                        | 0.13            | 0.02                        | 0.47           | 0.26                           | 0.52                    | 0.53            | 0.04                      | 0.45            | 0.01          | 0.22          | 0.36         | 0.48         | 0.13       | 0.01 | 1       |        |                |         |