INVESTIGATING THE IMPACT OF PROJECT PLANNING PROCESSES ON TIMELY COMPLETION OF CONSTRUCTION PROJECTS

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A research report submitted to the Department of Construction Economics and Management for the award of a Degree of Bachelor of Science in Quantity Surveying of Makerere University.

June, 2018
Declaration

I, Mwesigye Stephen declare that the content and details contained in this research report is entirely my original work and has never been submitted by anyone for the award of Bachelor of Science in Quantity Surveying of Makerere University.

Reg No.: 14/U/10402/PS

Signature: [Signature]

Date: 20/06/2018

Supervisor’s Approval

I, Dans Nshekanabo Naturinda do approve that the above student complied this work on his own, and that it is original.

Signature: [Signature]

Date: 20/06/2018
Dedication

This work is dedicated to my father, Mr. Mwesigye Tarsis Boyle. He has been a pillar that has supported me in this life. For the love, motivation, and the vision he has guided me to work towards, I am so thankful.
To my mother Florence Tumuhairwe, she has never given up on me. I am still here because of her.
To Victoria Katenga, my very dear friend and companion.
Acknowledgement

To begin with, I thank the Almighty God, who has made all my life’s accomplishments possible. From how I got into this world, my way through school and for finishing this research work, all the credit is God’s. I thank my parents, who have struggled to raise me and my siblings up, and for giving up some pleasures to see me through school and give me a happy life. I don’t know what I could have become without them.

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# LIST OF ACRONYMS

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMI</td>
<td>Project Management Institute</td>
</tr>
<tr>
<td>RII</td>
<td>Relative Importance Index</td>
</tr>
<tr>
<td>Ug.SH</td>
<td>Uganda Shillings</td>
</tr>
<tr>
<td>BOQs</td>
<td>Bill of Quantities</td>
</tr>
<tr>
<td>EPRC</td>
<td>Economic Policy Research Centre</td>
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ABSTRACT

This research study sought to identify the impact of project planning on timely completion of construction projects. The objectives of the study were; to examine the project planning process for construction projects, to assess unidentified gaps in construction project planning that lead to untimely project completion, and to evaluate the impact of project planning stages on timely project completion. The research questions were; what planning processes are used in construction projects? What unidentified gaps are present in the project planning process? How is proper planning likely to affect delays during project phases, and to what extent does it impact timely completion of projects?

The research approach was both qualitative and quantitative, and the design descriptive and correlative. A survey questionnaire was applied in the study. The sample population consisted of project managers. The sample size is 96 respondents, and the sampling technique used is convenient random sampling. The questionnaire was the data collection tool used. Data analysis technique used was Relative Importance Index (RII). A likert scale was also used.

The findings showed that the vast majority of construction projects undertaken between 2007 and 2017 were private funded projects. This was corresponded by the matching numbers of project managers who have worked in the private sector. 96% of respondents believe that project scheduling has the most impact on timely completion of construction projects. 91% and 87% respectively gave the information that defining scope of works and estimating activities’ duration, cost and resources per activity also have an influence on the completion time of projects. The research further established that not all the planning activities identified have an impact on timely completion of projects.

Recommendation include hiring experienced and competent project managers to lead the planning process, training the project planning team in the monitoring and supervision of construction works, and holding stakeholder meetings for consistent role-playing.
CHAPTER 1: INTRODUCTION

1.1 Background
Construction project planning is one of the basic procedures towards executing the project successfully. Before starting a construction project, proper planning and scheduling are needed to organize construction activities in a sequential manner (Vidhyasri & Sivagamasundari, 2017). However, many projects are still suffering from time overruns, an issue that clearly shows that there are loop holes in project planning and execution mechanisms.

Uganda in particular is constantly facing the problem of delays in construction project completions, and being a developing country, this hinders the country’s economic growth (The Observer, 2014). An attempt therefore, has to be made to address the issue of project late completion. According to Mohammed and Isah (2012) most delays on construction projects in developing countries occur due to ineffective planning.

Furthermore, analysis of completed projects in Ethiopia, another developing country, shows that a significant number of projects exceed the planned time and consequently incur the attached costs (Tekalign, 2014). This shows that there is a relationship between late project completion and developing countries, among which is Uganda. This research seeks to identify and note the keys issues concerning construction project planning processes and whether these processes are correctly adhered to in order to achieve timely completion of projects.

Wallace et al. (2012), as cited in AlNasseri, (2015, p. 5), goes on to explains that unrealistic schedules, deficient budgets and lack of visible milestones are all caused by poor planning and control. Without accurate estimates, project managers fail to properly allocate resources. As a result, there is excessive schedule pressures or unrealistic schedules that can increase project risk.

Since poor project planning and scheduling is a contractor-related delay cause, studies have noted that a skilled project manager and his team are responsible for the task of planning and controlling resources on a construction project (Odeyinka & Yusif, 1997; Prabhakar, 2008).

The success of a project, as confirmed in a study by Dvir and Lechler (2004), can be measured according to how best project planning is implemented. However if poor or no planning is done, variations of time, cost and quality are inevitable (AlNasseri, 2015). There is therefore an identification of variations in time caused by poor or ineffective planning, but
this research seeks to clearly assess the impact of project planning to the timely completion of construction projects.

In the construction industry, the housing sector is one of the leading contributors to Uganda’s economic growth. (Mukiibi, 2008). In their study, Katende et al. (2011) identified late project completion as one of the major factors hindering the growth of the construction industry in Uganda. This clearly shows the weight of the problem of late project completion in construction projects. This research study seeks to address this problem by focusing on the project planning processes.

1.2 Problem Statement
The problem of late project completion is still recurrent in the construction industry.

The issue of untimely completion could be attributed to improper practical implementation of pre-planning processes by the project manager and his team, lack of accurate information on risk monitoring and control, and poor forecasting of costs and material requirements. The presence of unidentified gaps in the project planning process could also be a likely cause of late completion of projects.

Untimely completions have significant economic and social effects. If a project takes longer time it will require additional resources in form of labour, materials, machinery and equipment. It may also lead to general increase in the cost of the project, litigation, and abandonment of the project. In Uganda, a developing country, late completion of construction projects affects the countries growth rate and economy.

Project planning is very important, and executing a project without developing a project plan often causes delays, general execution problems and high costs. Without a clear project plan, resources will be poorly managed, dates and budgets will not be effectively forecasted, there will be poor risk management, and poor communication on the project.

1.3 Main Objective
The research sought to assess the impact of project planning processes on timely completion of construction projects.

1.3.1 Specific Objectives
1. To examine the project planning process for construction projects.
2. To establish gaps in construction project planning that lead to untimely project completion.
To identify the extent of timely completion in the private and public sector in Uganda

1.4 Research Questions
1. What planning processes are used in construction projects?
2. Why is the problem still present even when the planning process is scrupulously adhered to? (What unidentified gaps are present in the project planning process?)
3. Which sector (public or private) has more cases of late completion of construction projects?

1.5 Study Scope
The study mainly focused on how project planning impacts timely completion of construction projects. The research focus was on construction projects executed in Kampala district from 2007 to 2017.

1.6 Significance
The results of the study may be able to point out the problem areas in project planning and how future construction projects may be handled to ensure that projects are completed on time. Furthermore, the study may equip university scholars, public and private organizations, and construction companies with additional knowledge in construction project planning and management. The research may also pave way for further research studies in the subject of project planning.

1.7 Organization of the Study
This study was organized into five chapters. The chapters are divided into chapter one which has the background of the study, purpose of the study, research objectives and research questions. As a general introductory chapter to the research study, chapter one also outlines the significance of the study, scope of the study and delimitation of the study, limitation, assumptions and definition of significant terms in the study.

In chapter two, literature is reviewed in relation with the research study. Chapter three outlined the research methodology. The chapter includes the research design, target population, sample size and sampling procedure. Also presented in chapter three is the data collection instruments, data collection and analysis procedures. Chapter four contains the research findings, data analysis, presentation and interpretations. Chapter five has the summary of the findings, discussions, conclusions and recommendations for action based on the research findings.
CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION
This chapter discusses the literature involved in this study. The chapter majors on the discussion of the research objectives as outlined and as researched by other scholars. The review of this chapter attempts to identify the existing relationship between the planning processes and project completion time.

2.2 CONSTRUCTION PROJECT PLANNING
Project planning can be defined differently, depending on who is defining it. According to Friblick and Olsson (2009), some people have defined it as organizing work requirements, resource planning, work preparation, etc. Simply, construction project planning can be defined as a process where the planner tries to identify the required activities for reaching a pre-determined result (Hendrickson, 1998).

According to Maylor (2005), the planning process always involves identifying the need to be done, estimating the required resources, estimating the duration of tasks, and identifying interaction between tasks. (as cited by Andersson & Rosenberg, 2012). Morris (1998) states that “The decisions made at the early definition stages set the strategic framework. Get it wrong here and the project will be wrong for a long time” (p.5). Generally, according to Elbeltagi (2009), planning answers the questions; what is to be done? how is it to be done? and who does it?

The project planning involves the process of preparing for the commitment of resources in the most economical manner. The planning defines the activities and actions, time, cost targets, and performance milestones which will result in successful project implementation and achievement of project objectives (Alice et al., 2015).

The critical project risk potentials in developing countries and possible source of concern to lenders, apart from inadequate scope descriptions and documentations are the ever present possibility that the project might not be executed as planned or projected (Turner, 2003).

In construction, planning is done at several stages. These plans include; corporate strategic plans, pre-tender plans, pre-contract plans, short-term construction plans, and long-term construction plans. These plans are different but all of them involve the following steps;

i) Transforming breakdown of work items into activities.

ii) Identifying the proper sequence by which the activities should be executed.
iii) Activities representation.
iv) Estimating the resources, time, and cost of individual activities.

While planning, it is vital to consider the uncertainties that might arise before, during, or after the project work. An uncertainty is a situation with no historic data relating to the situation being considered by the planner (Flanagan and Norman, 1993). Laufer et al. (1999) identified uncertainty as one of the major factors that influence project performance and determine its ultimate success.

Uncertainties may arise from anything connected to the project such as the environment in which the project is being carried out, the resources allocated to the project, or even the project schedules that alternate from time to time. Maylor (2005) explains that identifying, quantifying and planning mitigation measures for possible uncertainties helps in planning for risks on a construction project. (Bruni et al, 2011; as cited by Andersson & Rosenberg, 2012).

2.2.1 THE PURPOSE OF PLANNING
Project planning cannot, in advance, solve all unforeseen events, risks, and deviations, but it attempts to make a provision for all potential uncertainties in advance. (Awad et al., 2010) this helps the project team to be better equipped to handle potential risks, and in effect, minimize time loss, reduce wastage of resources and reduces costs too. Andersson & Rosenberg (2012) identify the major benefits of project planning as avoidance of unnecessary costs from unplanned activities and providing a basis for evaluating the different alternatives in order to filter out the unproductive ones.

At the start of the project, it is important to develop a project management plan which involves the following activities;

• Define the scope and create the WBS
• Sequence the activities, Estimate the duration and create the schedule
• Identify the risks and plan the responses
• Estimate the costs
• Plan the Human Resources and purchases
• Plan the Communication

The project management plan describes the organization of the project team by laying down its detailed structure, the roles and responsibilities of team members, and the communication
needs and reporting hierarchy. Furthermore, the project management plan also defines the project life cycle and the project scope.

The project scope has the following significance;

a) Defines the deliverables of the project – Project plan, design specifications, test plans, test cases, user documents, tested product and results etc.

b) Defines the functional and non-functional requirements – Use cases, screen shots, Process Flow Charts etc.

c) Defines the technical requirements – Deployment architecture, technology to use, licenses, bandwidth requirements, Disaster Recovery Plan etc.

In defining the project scope, a separate technical requirements document may be prepared to document the assumptions (assumptions are important sources of risk identification) and all the anticipated project constraints.

Monitoring, an element of project planning, helps site managers to flexibly change the ongoing work pace with the aim of successfully completing the project. (Divakar and Subramanian, 2009).

Knausender (2005) and Wikforss (2003) identify the importance of doing regular project evaluations. This helps site managers to identify the project aspects that require most attention. Studies have shown that if these aspects are not prioritized and focused on, there is a high likelihood of the project being abandoned, and late project completion. (as cited by Andersson & Rosenberg, 2012).

Chitkara (2005) explains that poor planning for implementation entails inadequacies in time plan, resource plan, equipment plan, coordination, organization, cost planning and improper pre/post contract actions. These result into inefficient and ineffective working delays, low resources productivity, change in scope, and illegal construction (as cited by Otim, 2011).

Ineffective planning and scheduling has also a major impact on construction delays. Effective planning and programming of a project is a must to secure early completion of the project. The planning process should be developed from start of the project until completion of a project. The planning stages should be devised very carefully, starting from strategic, tactical and operational planning (Ghulam & Kassim, 2009).
Lack of planning is likely to lead to incorrect assumptions and poorly thought out execution and the rework required to fix these mistakes will usually use up significant portions of project time. (Chatzoglou and Macaulay, 1996)

**Common Hindrances in Planning include:**

- a) The deliverable being inappropriate
- b) The time frame being unrealistic
- c) The resources being unavailable
- d) The cost being prohibitive

### 2.2.2 PROJECT PLANNING PROCESS

The major steps involved in the project planning process are as follows;

1. Defining the scope of work. This outlines the extent of deliverables.
2. Project scheduling. This involves the use of a Work Breakdown Structure (WBS) to come up with sequence for the activities. The forms of scheduling commonly used include; Gantt chart, network diagram, task matrix, and line-of-balance scheduling.
3. Developing the organizational structure and linking it with the WBS to identify responsibilities.
4. Determining the relationship between activities.
5. Estimate activities time duration, cost expenditure, and the resources required.
6. Formulating a risk register for risk management.

While carrying out preconstruction project planning, the activities are coordinated according to the time available. (Aldoson et al., 1996). To ensure that a project is completed on time, Hendrickson (1998) explains that it is important to formulate a time plan.

According to Soderberg (1999), construction project planning can be divided into three different levels depending on the time perspective. The first level is strategic planning which focuses on the team’s long term goals. The second level is the tactical planning which aims at forming a structure for the organization’s operations. The third level is the operational planning which focuses on attaining the project’s short-term goals. In a project, the operational planning is represented by weekly or working plans. These time plans involve resources and activities on a more detailed level. (as cited by Andersson & Rosenberg, 2012)
In a study, Laufer and Tucker (1987) resolved five most important factors to consider while carrying out construction project planning. These include; execution, coordination, control, forecasting and optimization.

**Execution:** this describes the way in which theoretical procedures can be practically realized. This stage should answer the questions of how the project should be done, who should do what, and when it should be done.

**Coordination:** this ensures that there is alignment between activities and workers in order to realize objectives.

**Control:** this involves the site manager monitoring progress and evaluating the performance of the project to ensure that objectives are achieved. According to Andersson and Rosenberg (2012), control minimizes the impact of the three risks that could occur in a project:

a) Conceptual risk: this arises from the planner’s inability to formulate the problem correctly such as choosing incorrect decision criteria or make wrong assumptions.

b) Administrative risk: this occurs when the team management fails to implement solutions.

c) Environmental risk: changes in the environment can cause problems even if there is an elaborated and well implemented plan.

**Forecasting:** this can be defined as the process of using past experience and knowledge to predict what will happen in the project. It serves as a decision-making control for the present and is important to minimize the effects of future problems.

**Optimization:** this is a process of finding the best solution based on the existing conditions. There are three different approaches to optimization:

a) Constructability planning: strives to find the most favorable integration of knowledge and experience by employing experts at an early stage. This enhances the chances of the design to be more precise in order to cut down costs and time.

b) Efficiency planning: the idea here is to maximize the performance of the available resources, or to minimize the required resources to perform at a specific level.

c) Contingency planning: can be described as planning in advance for the most likely future inconveniences. Several plans are prepared so that response time is quicker if an alternative plan is needed.
2.3 TIMELY PROJECT COMPLETION

A successful project is one that is completed within the agreed timeframe, budget and quality. Hence it is a fact that projects are temporary, which means that they have a start date and end date.

Timely completion majorly entails the ability to perform all duties according to the schedule. Although timely completion of the project is one of the determinants of its success, it is important to manage each project based on its uniqueness (Divakar & Subramanian, 2009). In order to achieve timely completion, it is important that all resources are allocated a time budget, so that in their implementation, the time aspect can be properly managed.

While planning for time, proper scheduling must be carried out in order to identify which activities are most critical so that the project is achieved within the planned completion time. (Vidhyasri & Sivagamasundari, 2017). In addition, adequate resources must be allocated to support the schedule, this is to say, resources must be allocated in a way that activities are implemented according to the plan set out on the schedules.

The project schedule communicates what work needs to be done, resources needed to perform the work and the time frame in which the work will be completed. Project scheduling involves summing up the time for individual subtasks to achieve an estimate of the total task time. This involves setting milestones (clear, unambiguous targets of what, by when).

Framing inaccurate work schedules increases the chances of occurrence of uncertainties which will result in overruns of time on the project. Resources utilization and reliability schedules need to match with the work plan and work schedules (Vidhyasri & Sivagamasundari, 2017).

2.3.1 Work Breakdown Structure (WBS)

This is an organizational tool for complex projects in which the scope of work is defined, and work is scheduled into smaller and manageable portions.

Activity List for the Work Breakdown Structure

a) Sequence the list of project activities
b) Determine the relationships between activities
c) Estimate the resource requirements for each activity
d) Estimate the duration for each activity
e) Determine the project duration (start and completion dates)

2.3.2 Order of Task Execution – Scheduling

1. Network Diagrams
Network diagrams are important for identifying activities that control the project length, clearly showing the task dependencies and the available float for non-critical activities. Under network diagrams, two methods maybe used;
a) Critical Path Method (CPM) – commonly used within construction projects
b) Program Evaluation and Review Technique (PERT) - like a generalized CPM and assumes that an activity’s duration cannot be precisely determined

2. Bar / Gantt Charts
These contain schedules, and progress is graphically depicted on a single chart. They are good for status reporting and are simple and the most used scheduling diagrams.
To estimate the resource requirement for each activity, the dependency between tasks should be considered, and information from previous, almost similar projects may also be relied upon.

Untimely project completion may have positive outcomes if the project is completed earlier than the scheduled time, but if it is completed way beyond the planned time, negative effects may arise. Therefore, the goal of the project manager and his team should be to achieve the desired project outcome in the planned time or even before.
CHAPTER 3: METHODOLOGY

3.1 Introduction
This chapter gives the details of the research nature and pattern. The research design is explained, the target population described as well as data collection instrument. Also included in this chapter is data collection procedures, methods of data analysis, operationalization of variables and the ethical issues observed in the research.

3.2 Research Design
The research approach is both qualitative and quantitative, and the design of the study is descriptive and correlative in nature. The research design is correlative because it seeks to establish a relationship between the independent and the dependent variable. The descriptive design seeks to give a causal relationship between timely completion of construction projects as the dependent variable, and project planning processes as the independent variables.

3.3 Target Population
The target population of the survey consists of project managers, who took part in construction projects executed in Kampala district between 2007 and 2017. The main aim of choosing this type of population is to get accurate information concerning construction project planning.

3.4 Sampling Type
Random sampling method was applied in order to achieve the most desirable sample size for the study and convenient random sampling was used to select and approach the respondents.

3.5 Sample Size
According to Leedy et. al., (2005) as cited by Munyoki (2014), the researcher should aim at maximizing the sample size.
Since the size of the population is unknown, the sample size ($n_0$) was estimated using Cochran’s formula;

$$n_0 = \frac{Z^2pq}{e^2}$$

Where:
Z = standard normal deviation set at 95% confidence level ($z = 1.96$)
p = percentage picking a choice or response (standard deviation, assumed to be 0.5)
q = 1 - p
\[ e = \text{confidence interval (margin of error, assumed to be } -/+ 10\%\text{)} \]

The sample size was calculated as follows;

\[ n_0 = \frac{(1.96 \times 1.96) \times 0.5 \times 0.5}{(0.1 \times 0.1)} \]

\[ = 96 \]

From the calculation, 96 projects managers were identified to represent the entire population of project managers in Kampala District.

3.6 Data Collection Instrument

The instrument of data collection employed was a questionnaire. The questionnaire has section A that gives the background information of the respondent. This includes the sector in which they work, years of experience they have in the construction industry, and the number of construction projects that have worked on. Section B seeks to identify the unidentified gaps in the construction project planning.

The last section, C, seeks to evaluate the extent to which construction project planning processes cause delays on the construction project. In this section, respondents were asked to rank project planning processes depending on the level of their effect on timely project completion.

3.7 Data Collection Procedure

The researcher and research assistant used questionnaires as the tool for data collection. The target population was project managers, who according to their qualifications and experience, were assumed to be able to read and understand questions put out in the questionnaire. 8 questionnaires were administered via email to the respondents. The rest of the questionnaires were administered to the respondents in person. In both cases, the respondents expressed satisfaction with how easy and convenient it was to fill in the questionnaire.

3.8 Data Analysis Techniques

This research is both quantitative and qualitative in nature. For ease of clarity in communication and presentation of results multiple analytical tools were employed for both numerical and theoretical data. This aimed to improve on validity of the data.

In section B of the questionnaire, the data about the gaps present in the construction planning process was analysed depending on the responses about the common methods of planning.
practiced by the respondents, and literature review was used to build arguments and identify uncertainties in project planning that lead to late completion.

Section C of the questionnaire deals with the impact of planning to timely completion, and RII was employed in finding the contribution a particular variable makes to the prediction of a criterion variable. RII was used to rank the frequency of occurrence. The five-point likert scale of 1 to 5 is based on to calculate relative importance indices for each of the planning processes. The scoring as indicated in the questionnaire describes scoring (1) as Very High, (2) as High, (3) as Moderate or Neutral, (4) as Low, and (5) as Ignorable.

The likert scale is interpreted as follows;

<table>
<thead>
<tr>
<th>Score (%)</th>
<th>Very High</th>
<th>Moderate</th>
<th>Ignorable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>100 – 65</td>
<td>64– 40</td>
<td>39 – 0</td>
</tr>
<tr>
<td>Opinion</td>
<td>Positive</td>
<td>Neutral</td>
<td>Negative</td>
</tr>
<tr>
<td>RII</td>
<td>5n1+4n2+3n3+2n4+n5</td>
<td>(\frac{5N}{5N})</td>
<td></td>
</tr>
</tbody>
</table>

Based on the ranking (R) of the weighted average of the relative importance indices (RII) for the planning processes, the most critical planning processes (or those that heavily impact timely completion are determined).
3.9 Ethical Considerations

According to Punch (2005), when considering a questionnaire-based survey targeting project stakeholder perspectives, it is important to consider all ethical concerns relating to those stakeholders. During the implementation of the survey, ethical concerns were considered as follows: informed consent, treatment of collected information from respondents with privacy and confidentiality, avoiding the use of sensitive questions or statements that could cause embarrassment to respondents, diversifying data collection and communication methods to reduce bias in responses, and presenting the researcher, research objectives and expected outcomes to interested organizations and project stakeholders.
CHAPTER FOUR: DATA ANALYSIS, PRESENTATIONS AND INTERPRETATIONS

4.1 Introduction
This chapter presents results of the data collection. This is guided by the research objectives to present empirical evidence to either agree or controvert. The objectives were to examine the planning process for construction projects, to assess unidentified gaps in construction project planning that lead to untimely project completion, to evaluate the impact of project planning stages on timely project completion. Relative importance index has been used to rank the frequency of occurrence, and to give an overview of project planning impact on timely completion of projects.

4.2 Questionnaire Return Rate
The researcher issued out 96 questionnaires, with the help of a research assistant. Various reminders and follow-ups were made in form of text messages, emails, and calls to ensure that the questionnaires were filled and returned. Only 95 questionnaires were returned.

Questionnaire return rate = \( \frac{95}{96} \times 100 = 99\% \)

As per the calculation, the questionnaire return rate is 99%. According to Babbie as cited by Ayudhya (2011), while any rate of questionnaire return rate of over 50% can be considerably reported, the overall value of above 60% and 70% can be mentioned as good and excellent respectively.

4.3 Information on Respondents
This section introduces the respondent in relevance to the data being collected. It identifies the years of experience the respondent has in construction project planning, the sector they work in (private or public), and the number of construction projects they have worked on in Kampala district between 2007 and 2017. The purpose of this section is to find out whether the respondent has enough experience in project planning, and the data collected on the sectors tries to identify if there is any relationship between the sectors and project planning or timely completion.
Table 1: Sector distribution in frequency and percentage

<table>
<thead>
<tr>
<th>SECTOR</th>
<th>FREQUENCY</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRIVATE</td>
<td>67</td>
<td>70.53 %</td>
</tr>
<tr>
<td>PUBLIC</td>
<td>28</td>
<td>29.47 %</td>
</tr>
<tr>
<td>TOTAL</td>
<td>95</td>
<td>100 %</td>
</tr>
</tbody>
</table>

The importance of getting information on the respondents’ sector was to identify a pattern of late project completion cases per sector. From data collected through convenience sampling, the majority of respondents have undertaken more projects in the private sector, with a percentage of 70.53% as shown in the table above. Research made by EPRC (2018) notes that Uganda’s private sector has substantially improved in development and competitiveness, becoming a key engine of economic growth. This proves and correlates with the identified higher number of projects (depicted by number of respondents) in the private sector compared to the public sector.

4.4 The relationship between the public and private sector and late completion

The respondent was asked to rate the occurrence of late completion in their sector using a scale of 1 to 5. The following results were obtained.

1. The Public Sector

Table 2: Late Completion in the Public Sector

<table>
<thead>
<tr>
<th>FREQUENCY OF LATE COMPLETION OCCURRENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Using $R_{II} = \frac{1n1+2n2+3n3+4n4+5n5}{5N}$

$= 0.571$
2. The Private Sector

Table 3: Late Completion in the Private Sector

<table>
<thead>
<tr>
<th>FREQUENCY OF LATE COMPLETION OCCURRENCE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>13</td>
<td>18</td>
<td>29</td>
<td>5</td>
</tr>
</tbody>
</table>

Using \( RII = \frac{n_1+2n_2+3n_3+4n_4+5n_5}{5N} \)

\[ = 0.666 \]

A Graph showing the Occurrence of Late Completion in the Private and Public Sector

The importance of getting information on the respondents’ sector was to identify a pattern of late project completion cases per sector.

The number of respondents approached that belong to the private sector is higher (67 respondents) compared to the public sector, with 28 respondents.
The relative importance index for the private sector (0.666) is higher than that for the public sector (0.5710 indicating a higher rate of late completion occurrence in the private sector than in the public sector.

4.5 The Impact of the Project Manager’s Experience on Timely Completion of Construction Projects

The respondents were asked to rank the given range of years of experience that a project manager should have to be able to combat late completion of construction projects.

Table 4: Frequency of Late completion according to Years of Experience

<table>
<thead>
<tr>
<th>YEARS (EXPERIENCE)</th>
<th>FREQUENCY OF RANKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>1–5</td>
<td>10</td>
</tr>
<tr>
<td>6–9</td>
<td>0</td>
</tr>
<tr>
<td>10–14</td>
<td>0</td>
</tr>
<tr>
<td>15–19</td>
<td>0</td>
</tr>
<tr>
<td>20–25</td>
<td>0</td>
</tr>
</tbody>
</table>

Ranking using Relative Importance Index

Using \( \text{RII} = \frac{1n1+2n2+3n3+4n4+5n5}{5N} \)

<table>
<thead>
<tr>
<th>Years of Experience</th>
<th>RII</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–5</td>
<td>0.537</td>
<td>5</td>
</tr>
<tr>
<td>6–9</td>
<td>0.728</td>
<td>3</td>
</tr>
<tr>
<td>10–14</td>
<td>0.823</td>
<td>2</td>
</tr>
<tr>
<td>15–19</td>
<td>0.924</td>
<td>1</td>
</tr>
<tr>
<td>20–25</td>
<td>0.629</td>
<td>4</td>
</tr>
</tbody>
</table>
The researcher sought to establish whether there was any relationship with the project manager’s experience and timely completion of projects that the project manager handled.

The results indicated that there was a trend of years for which late project completion issues reduced with the increase in the project manager’s experience. Between 1 to 19 years of experience, the graph indicates less cases of late completion as the yeas increase. However, from the 20th year onwards, late completion is seen to increase again. From the respondents’ opinions, the increase of late completion from the 20th year onwards is due to changes and improvements in project planning and management, growth of trends and changes in technology, and changes in roles and responsibilities of the project team.

4.7 Unidentified gaps in the construction project planning process

An assessment was made after the respondents were asked to attempt to identify, in their opinions, the common behavioural and technical occurrences that they think have delayed the project at all stages during implementation. These opinions guided the researcher to identify
the commonly ignored and seemingly less impactful factors that caused delays during all phases of construction. The respondents identified the following issues;

i) Lack of enough experience to handle broad, complex projects
ii) Unclear project scope
iii) Failure to understand terms used in the documents and failure to interpret drawings
iv) Mishandling and misplacement of project documents, such as drawings, specifications, etc.
v) Lack of direction on site (confusion) by workers on site due to lack of clear duties allocation.
vi) Indecision by the client concerning financial issues
vii) Delays and failure to pay workers on site
viii) Site management inconveniences for example poor quality of food for workers, dirty toilets, and poor general sanitation on site, etc.

From analysis of literature review, such commonly ignored causes of delays would later have a large impact on completion time because they are uncertainties and hence couldn’t be adequately planned for.

4.7.1 The following are the identified uncertainties that contribute to late completion of construction projects.
1. Using ambiguous terms and definitions in project documentation leads to misunderstandings between project participants and even the project team members.
2. Disorderly management of project documents leads to chaos, unclear management procedures and unclear distinction between technical design documents and work implementation documents.
3. Different data formats (drawings prepared with different software), different project language in terms of design and document files can lead to communication breakdown and time wastage.
4. Low qualification and professional training of employees at all levels, including the lack of experience by the contractor regarding unique technical (and technological) aspects of the works in the project.
5. Delays from lack of immediate technical and financial resources to counter the increase in the scope of works. This is commonly due to unplanned work force, unordered materials, unrented machinery, etc.
6. Rapid increase of prices of fast designs in relation with delayed implementation of design changes on site due to indecision by the client on design (making constant changes) and delayed problem solutions prepared by the designers.

7. Increased unforeseen client expenses according to contractual obligations to banks and other investment sources affecting the funding of the project.

8. Lack of competent management tools especially for complex projects (in terms of software, hardware, and machinery), incomplete understanding of scope and work details per scope by the team, and irrational organization of works on site due to lack of clear work schedules.

9. Unclear responsibility limits and lack of strict contractual obligations. Ambiguous contractual obligations between the client and contractor, or contractor and sub-contractor result into a lot of disputes, which result into loss of time on the project.

10. Inability to forecast unexpected external events.

It is important to note that while project planning is being carried out, risk planning and assessment is done for those factors and conditions that might be expected to occur during project implementation (risks), and a financial and time provision might be allocated for them (they are quantifiable). However, the factors hereby identified are those that are usually not planned for, and therefore come off as uncertain. This means that while planning can be implemented satisfactorily to ensure that the project is completed on time, a combination of these unexpected factors may cause considerable delays eventually leading to late completion of the project.

**4.8 Results for ‘Extent to which construction planning processes cause delays on the construction project’**

Major construction planning processes were identified and presented to the respondent to determine, in his opinion, which processes were more important than others based on a scale of 1 to 5 according to their levels of importance.

The purpose of this was to determine the planning stages that have a noteworthy effect on timely completion and those that do not. Results from the respondents are provided in table 3 below.
### Table 5 Frequency of Ranks

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>FREQUENCY OF RANKS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Defining scope of works</td>
<td>53</td>
</tr>
<tr>
<td>Project scheduling</td>
<td>78</td>
</tr>
<tr>
<td>Linking organizational structure with WBS</td>
<td>0</td>
</tr>
<tr>
<td>Determining relationship between activities</td>
<td>0</td>
</tr>
<tr>
<td>Estimating activities’ duration, cost and resources per activity</td>
<td>41</td>
</tr>
<tr>
<td>Preparing risk register</td>
<td>0</td>
</tr>
</tbody>
</table>

### 4.8.1 Ranking using Relative Importance Index

Using \( RII = \frac{5n_1+4n_2+3n_3+2n_4+1n_5}{5N} \)

### Table 6 Summary of RII

<table>
<thead>
<tr>
<th>No.</th>
<th>Planning process</th>
<th>RII</th>
<th>Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Defining scope of works</td>
<td>0.912</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>Project scheduling</td>
<td>0.964</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>Linking organizational structure with WBS</td>
<td>0.603</td>
<td>5</td>
</tr>
<tr>
<td>4</td>
<td>Determining relationship between activities</td>
<td>0.680</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Estimating activities’ duration, cost and resources per activity</td>
<td>0.870</td>
<td>3</td>
</tr>
<tr>
<td>6</td>
<td>Preparing risk register</td>
<td>0.552</td>
<td>6</td>
</tr>
</tbody>
</table>

From the summary of the results shown in the table above, it can be observed that the planning processes that have the most impact on project timely completion are: project scheduling (RII = 0.964), defining scope of works (RII = 0.912), estimating activities’ duration, cost and resources per activity (RII = 0.870), and determining the relationship between activities (RII = 0.680).
Consequently, the research hitherto established that linking organizational structure with WBS and preparing the risk register had less effect on timely completion construction projects. Therefore, in as far as evaluating the impact on timely completion was concerned, the factors that registered RII<0.650 were considered insignificant on having a reasonable impact on project completion time.

4.8.2 Level of Importance of Construction Planning Processes

![Bar chart showing the level of importance of construction planning processes.](image)

**Figure 3: A Graph showing the Level of Importance of Construction Planning Processes**
CHAPTER FIVE: SUMMARY OF THE FINDINGS, DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction
This chapter gives a summary of the findings from the analysis in chapter four. The discussions are guided by the research objectives and establish that the data collected was guided by the research questions. Based on the findings, conclusions have been made and recommendations suggested.

5.2 Summary of the findings

The occurrence of late completion is identified to be higher in the private sector compared to the public sector. In the private sector, late completion occurrence is 67% compared to the public sector at 57%. From EPRC (2018) findings, late completion cases in the private sector are less due to more established systems of work, composite construction partnerships such as serial tendering, and less financial complications on funding the projects.

From the findings, the majority of the project managers (70%) have worked in the private sector compared to the public sector. Research further shows that the rate of late completion of construction projects is more in the private sector with a RII of 0.666 compare to 0.571 for the public sector.

Unidentified gaps or uncertainties in project planning have been identified from a number of commonly ignored and seemingly less impactful factors. These easy-to-ignore factors were just a background for bigger problems which are not easily quantifiable and are hard to plan for. A combination of these uncertainties would later have a large impact on the completion time of construction projects.

The researcher has identified some as follows; using ambiguous terms and definitions in project documentation, disorderly management of project documents leads to chaos and unclear management procedures, low qualification and professional training of employees at all levels, delays from lack of immediate technical and financial resources to counter the increase in the scope of works, rapid increase of prices of fast designs in relation with delayed implementation of design changes, increased unforeseen client expenses, lack of competent management tools especially for complex projects, and unclear responsibility limits and lack of strict contractual obligations.
These gaps were identified after the respondents identified the common behavioural and technical short comings that they experienced, which did not seem to have a reasonable impact on timely completion of projects.

The research identified a trend in the project manager’s experience and timely completion. The results were such that, the more experience the project manager has between a period of 1 to 19 years, the less likely it is to encounter late completion issues (in relation to planning alone). For project managers with above 20 years of experience, there are still more cases of late completion cases happening. The causes of this trend are identified to be; changes in roles in project management, and growth in technological trends in the construction industry in Uganda.

Furthermore, respondents selected the following as the main planning processes that have relevant impact on project timely completion: project scheduling was identified to have the highest impact, with a Relative Importance Index (RII) of 0.964, then defining scope of works, with RII of 0.912, estimating activities’ duration, cost and resources per activity had RII of 0.870, and determining the relationship between activities had RII of 0.680. Construction project planning processes which are identified not to have a considerable impact on timely project completion were; linking organizational structure with WBS (with RII of 0.603) and preparing the risk register (with RII of 0.552)

**5.3 Discussions**
The research findings indicate that project planning has a large impact on timely completion of construction projects and will largely affect a successful implementation of a construction project. These research findings agree with research done by other scholars on subjects relating to project planning and timely completion of construction projects. While assessing the level of importance of project planning processes, findings show that not all project planning processes have an impact on the timely completion of construction projects. The planning processes that have an impact on timely completion were identified to be project scheduling, estimating activities’ duration, cost and resources per activity, defining scope of works and determining relationship between activities.

The major question of research concerns the cause of delays during project execution. As delays occur, they may either be combated before the project is completed so that the project
meets its targeted completion time, or such delays may be of such magnitude that they cannot be compensated for and the time lag accumulates, leading to late project completion. It has been agreed upon that project planning is an important procedure that every project, at its inception, goes through. This research tries to identify the underlying factors that still cause construction projects to suffer from time overruns, when the project planning procedure has been undertaken.

The uncertain events identified to have an impact on the project’s completion time had to do with un-clear planning and technical language, disorderly management and handling of documents, incompetent team members and leaders, unforeseen increments in the client’s expenses affecting financing of the project, where majority of project managers reported cash flow problems from the client, mostly delayed payment of certificates. According to the payment terms agreed upon, the contractor is contractually obliged to perform within the specified time period for a specified amount of money (Thornton, 1988).

On average, most construction projects in East Africa suffer a 13.5% cost increase and depending on the client’s capacity; this may affect the project’s completion time (Muyoki, 2014). When the contingency amount of the project has been exhausted, the project may be stalled for some time until the client gets funds. Cases however, have occurred where the project has been abandoned from failure to get additional funds. A study by Bromilow (Time-Cost Model, 1974) found out that only one-eighth of building contracts were completed within the scheduled time, and that the overall time overrun measured up to 35%. Recent studies however, indicate the time overrun to have reduced to 25% (Michael & Martin, 2014).

The planning phase should ensure that proper pre-planning is done. If this is not done, difficulties ahead may not be forecasted and eventually a contingency plan to mitigate them will not be in place. During construction planning, the project manager should ensure that the project schedule or program of works is carefully followed. This will ensure that tasks are begun and completed according to the time allocated to them in the schedule of works. This also ensures that material delivery on site is timely because the project tasks are anticipated ahead of time. Experienced construction workers will also help in coming up with the most practical program of works that is not over ambitious or unrealistic.
5.4 Conclusions
Construction project planning is an issue that should be taken seriously, and that needs to be continuously done even as the project progresses. The planning effort is an important factor that influences project performance as identified in different studies, and the project plan is the roadmap that defines how to get to the results from the very beginning. (Omran et al., 2012).

The planning stages should be followed and implemented carefully so as to avoid problems can be easily solved. In my opinion, the execution stage of the project would rather be stalled by unexpected events other than those that can be avoided by simply following planning guidelines. Therefore, pre-project planning should be done by developing sufficient information with which owners can address uncertainties and decide to commit resources while aiming to maximize the chances for a successful project.

Timely completion of construction projects is not unachievable. It is a matter of the project manager’s flexibility to identify all the factors that put the time target at stake and play with the available resources to ensure that the time target is achieved. However, the cost aspect of the project should not be ignored while the project manager and other stakeholders try to finish the project on time. To compensate for lost time at different project phases, the contractor might increase the labour input and this affects the project cost in the long run. Every stakeholder in the construction project’s implementation should be sensitized on the possibility that every project may suffer delays in contract duration and that it may definitely increase the project costs. Therefore much effort should be put at trying to avoid the delays at every phase.

5.5 Recommendations
1. Experienced and competent project managers should be employed to ensure that the right project leadership team is leading the process of construction project planning and implementation. Project program should be properly designed, and regular supervision and inspection made to sure that the program is followed while doing timely and appropriate amendments to ensure successful project delivery.

2. The project manager’s technical team should be trained on all factors that are likely to affect project planning. Budget, scope and timelines should be consistently monitored and supervised so that quality work can be achieved.
3. Studies must be performed and scope definition documents prepared in order to facilitate a smooth transition from planning to design and construction. These scope definition documents generally relate to site assessment, equipment identification, flow design, and design parameters. These and other planning tools are essential to ensure that critical project scope risk issues are addressed.

4. Contractors should do constant supervision of workers, and monitor the motivation levels of workers from time to time. This will ensure that the right amount of work is done in the required time. Highly motivated workers have a large output on the project and save a lot of time during project implementation.

5. The planning team should always choose an appropriate execution approach to ensure a good basis for successfully managing the project during design and construction. Failure to properly address design and construction execution issues in pre-project planning could severely impact the cost and schedule performance of the project.

6. The project team should be able to address baseline cost and schedule development, execution planning issues, the acquisition strategy, long-lead purchasing requirements, and commissioning/start-up plans.
REFERENCES


Elbeltagi, E. (2012). Lecture notes on construction planning and scheduling. Faculty of Engineering, Mansoura University.


https://www.researchgate.net/publication/27469663_The_Predictive_Ability_of_Bromilow's_Time-Cost_Model


APPENDICES

APPENDIX I: QUESTIONNAIRE

My name is Stephen Mwesigye. I am a Quantity Surveying student at the School of Built Environment, Makerere University. I am carrying out a research on the Impact of Project Planning Processes on Timely Completion of Construction Projects. I humbly request that you take time and give me your honest answers to the questions below. The findings of this research will be posted to you after analysis, in case you’re interested. Thank you for agreeing to participate in this research. If it is the respondent’s desire, this information will be handled as anonymously as possible. In case the information provided herein is published, the respondent’s identity will not be disclosed.

PART A: RESPONDENT’S INFORMATION (Please tick or fill in the gaps where necessary)

1. What sector do you work in? Public ☐ Private ☐

2. How many years of experience do you have in construction project planning?

3. How many construction projects have you executed in Kampala for the last 10 years?

PART B: UNIDENTIFIED GAPS IN THE CONSTRUCTION PROJECT PLANNING PROCESS.

Issue: Untimely project completion could still take place even when the right planning procedures have been followed. This means that there could still be unidentified gaps/uncertainties in the project planning process.

In your opinion, what are the common behavioral and technical occurrences that have delayed the project at all stages of implementation? (Your opinions will guide the researcher to identify the uncertainties in project planning)
PART C: According to your sector, what is the frequency of occurrence of late completion of construction projects? [Please tick (√) in the respective box]

5 = Very High
4 = High
3 = Moderate
2 = Low
1 = Ignorable

| FREQUENCY OF LATE COMPLETION OCCURRENCE |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
PART D: EXTENT TO WHICH CONSTRUCTION PROJECT PLANNING PROCESSES CAUSE DELAYS ON THE CONSTRUCTION PROJECT.

In your opinion, please indicate the extent to which each planning process indicated is likely to cause delays on the construction project if not properly implemented. [Please tick (✓) in the respective box]

1 = Very High  
2 = High  
3 = Moderate  
4 = Low  
5 = Ignorable

<table>
<thead>
<tr>
<th>PROCESS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defining scope of works</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project scheduling</td>
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<tr>
<td>Linking Organizational structure with WBS</td>
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