4.1 Introduction

The results obtained from the statistical analysis (SPSS statistic) were interpreted regarding their corresponding research questions and hypothesis. The theoretical part of the research played an important role in the interpretation. Here below are the interpretations of some results:

4.2 Status of construction industry in Sudan:

With respect to the question regarding “construction industry development” the respondent were asked (construction industry in Sudan is witnessing a significant development) and their answers shows that;

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid agree</td>
<td>66</td>
<td>25.0</td>
<td>32.0</td>
<td>32.0</td>
</tr>
<tr>
<td>Valid disagree</td>
<td>18</td>
<td>7.0</td>
<td>10.0</td>
<td>42.0</td>
</tr>
<tr>
<td>Valid strongly disagree</td>
<td>6</td>
<td>2.0</td>
<td>2.0</td>
<td>44.0</td>
</tr>
<tr>
<td>Valid Total</td>
<td>50</td>
<td>100.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

Fig 4.1 “Status of construction industry in Sudan” chart
48% are disagreed of such statement which explains that the industry still needs more efforts in order to meet the most of its audience requirements.

4.3 The construction project stages:

With respect to the question regarding, the respondent were asked (construction project consist of a series of advanced stages) and their answers shows that:

Fig 4.2 "construction project stages" chart

86% of the respondents agreed to this statement.
4.4 Importance of the planning process:

With respect to the question regarding “planning process importance” the respondent were asked (The planning process is the basic for any project) and their answers shows that;

![Chart showing the importance of planning process]

**Fig 4.3 "Importance the planning of process " chart**

100% of the respondents agreed to this statement, so planning is essential and important for any project.

4.5 There is no great attention for planning process in Sudan:

With respect to the question regarding, the respondent were asked (when practicing construction industry in Sudan planning process doesn’t given a great attention.) and their answers shows that;
Fig 4.4 "there is no great attention for planning process in Sudan" chart

As 80% of the respondents agreed that planning process doesn't given a great attention in Sudan.

4.6 Awareness of the planning process concept:
With respect to the question regarding “engineers awareness” the respondent were asked (awareness among engineers in the construction sector about planning process is not enough) and their answers shows that;

<table>
<thead>
<tr>
<th></th>
<th>strongly agree</th>
<th>agree</th>
<th>disagree</th>
<th>strongly disagree</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency</td>
<td>15</td>
<td>25</td>
<td>8</td>
<td>2</td>
<td>50</td>
</tr>
<tr>
<td>Percent</td>
<td>30.0</td>
<td>50.0</td>
<td>16.0</td>
<td>4.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Valid Percent</td>
<td>30.0</td>
<td>50.0</td>
<td>16.0</td>
<td>4.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Cumulative Percent</td>
<td>30.0</td>
<td>80.0</td>
<td>96.0</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>
Fig 4.5 “engineer’s awareness” chart

Most of the respondents insured that the awareness of the engineers about planning process is very low. This could be observed clearly in practice, where most of the raised problems and claims are caused by scope, time or cost creep. These creeps are symptoms of ill management and planning.

4.7 Planning processes are carried out in traditional way:
With respect to the question regarding, the respondent were asked (Planning processes are carried out in traditional way) and their answers shows that;
Fig 4.6 "planning processes are carried out in traditional way" chart

98% of the respondents agreed to this statement.

4.8 Resources availability and clarity:

With respect to the question regarding "Resource availability and clarity", the respondent were asked (when preparing the planning process the resources required are not provide and not clear) and their answers shows that;
4.9 Dividing the project into enforceable tasks and activities:

With respect to the question regarding “Dividing the project into enforceable tasks and activities” the respondent were asked (planning process depend on divided the project into enforceable tasks and activities) and their answers shows that;

![Fig 4.7 "Resources availability and clarity"](chart.png)
4.10 Planning is a continuous process:

With respect to the question regarding “planning is a continuous process” the respondent were asked (planning is continuous process until the project completion) and their answers shows that;

**Fig 4.8 "Dividing project into enforceable tasks" chart**
4.11 Planning helps to improve performance levels:

With respect to the question regarding “Planning helps to improve performance levels” the respondent were asked (Good planning helps in improving the performance levels in construction projects) and their answers shows that;
Fig 4.10 "planning helps to improve performance levels" chart

As 98% agreed to the statement that good planning helps in improving performance levels and lead to successful project, planning process phase should take more attention from the projects planner because its results will affect the project execution.

4.12 Overtaking problems in projects:

With respect to the question regarding “Overtaking problems in projects” the respondent were asked (The overtaking problems in projects due to poor planning and implementation) and their answers shows that;
4.13 The relationship between productivity and planning:

With respect to the question regarding “relationship between productivity and planning” the respondent were asked (there is a strong relationship between the productivity of labor and the planning process for any project) and their answers shows that;
As 98% of the response believes that there is a strong link between productivity and planning process. This proves the importance of this process and the strong need for increasing the awareness of planning techniques.

4.14 Planning section:

With respect to the question regarding “planning section” the respondent were asked (in the company in which you work the operate the planning process through a qualified section) and their answers shows that;
Fig 4.13 "planning sector"

4.15 Training courses:

With respect to the question regarding “training courses” the respondent were asked (it’s necessary to make training courses for employees of the company in the field of planning) and their answers shows that;
As 98% agreed that it is necessary to make training courses for the engineers, this proves that the training and career development are essential in any company or organization that aims to progressing. Training simply refers to the process of acquiring essential skills required for a certain job. It targets specific goals, for instance understanding a process and operating a certain system. Career development, on the other side, put emphasis on broader skills, which are applicable in a wide range of situations. This includes decision making, thinking creatively and managing people.

4.16 The clarity of owner's requirements and engineer's output:

With respect to the question regarding “the clarity of owner's requirements and engineer's output:” the respondent were asked (When preparing the project plan...
there is a lack of clarity in the owner’s requirements and the engineer’s inputs) and their answers shows that;

**Fig 4.15"the clarity in the owner’s requirements and the engineer’s inputs" chart**

4.17 Scope of the project:
With respect to the question regarding “scope of project ” the respondent were asked (determine the scope of the project from the basis of the planning process) and their answers shows that;
4.18 Computer programs are used in Sudan:
With respect to the question regarding “computer programs are used in Sudan” the respondent were asked (computer programs are used in preparation of project planning in Sudan) and their answers shows that;
4.19 The affect of economic changes project plan:

With respect to the question regarding “economic changes” the respondent were asked (economic and financial changes in Sudan significantly affect the implementation of the project plan) and their answers shows that;

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**Fig 4.17 "computer programs are used in Sudan" chart**
This kind of risk is recognized by about 98% out of the respondents relating to the construction industry. As the phenomenon of continually facing a variety of situation involving many unknown, unexpected, frequently undesirable and often unpredictable factors. Economic changes influence project performance on terms of time, cost and quality in negative or positive ways. And it’s classified as internal risk factors. Risk management should be considered in the project planning process to avoid unexpected and unpredictable risks that can occur during the implementation of the project.
4.20 Educational Syllabi in the area of planning:

With respect to the question regarding “Education Syllabi” the respondent were asked (the faculties of engineering education syllabi provide sufficient doses in the area of planning and scheduling projects) and their answers shows that;

As 86% of the audience response are of a disagree mode, it is very essential to give more attention to this issue. The syllabi conducted in the engineer’s faculties could not satisfy the requirements of the status.

**Fig 4.19 “Education Syllabi” chart**

- As 86% of the audience response are of a disagree mode, it is very essential to give more attention to this issue. The syllabi conducted in the engineer’s faculties could not satisfy the requirements of the status.
4.21 The planning process outputs:

With respect to the question regarding “the planning process” the respondent were asked (the output of the planning process includes important elements in the project contract) and their answers shows that;

![Fig 4.20 "planning output" chart](image)

4.22 The quality of contract:

With respect to the question regarding “the quality of contract” the respondent were asked (The quality of the preparation of the contract and good management are of the reasons for the success of the project plan) and their answers shows that;
4.23 The use of planning computer programs:

With respect to the question regarding “planning computer programs” the respondent were asked (the use of planning computer programs helps to develop a successful plan of the project) and their answers shows that;
CHAPTER FOUR

INTERPRETATION

Fig 4.22 “planning computer programs” chart

- 98% of the audiences were aware of the importance of using computer application technology which equips engineers with knowledge, skills, values and attitudes to create, design and communicate information in different formats. It also makes it possible for engineers to collect, analyze and edit data and to manipulate, process, present, communicate information to different sectors. Using computer applications make it easy to communicate information together and easy access.

4.24 Engineers ability to use planning computer programs:

With respect to the question regarding “engineers ability” the respondent were asked (the use of planning computer programs helps to develop a successful plan of the project) and their answers shows that;
Fig 4.23 "engineers ability to use planning computer programs" chart