
RESEARCH ARTICLE

Effective Implementation and its Impact on Achieving Project Objectives: An Applied Study on Al-Mak Nimr Development and Contracting Co. Ltd. and Danfodio Contracting, Roads and Bridges Co. Ltd. during the Period 2006 to 2013

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ABSTRACT

The present study attempts to identify the impact of effective implementation on construction projects in Sudan achievement of their objectives, to identify the obstacles that face their implementation in the time and at the cost specified, to find out the various factors that should be taken into account when establishing these projects and to highlight the scientific methods of managing major construction projects in Sudan in order to reach management methods that help controlling projects positively and contributes to achieving their objectives effectively. The study adopted the historical approach, the deductive approach, and the analytical descriptive approach. The study aimed to determine the defects in major construction project implementation, to investigate their causes and to clarify scientific solutions to them. The most important hypotheses of the study: There is a statistically significant relationship between the effectiveness of project implementation and the achievement of their objectives. The study concluded with several findings, the most important: The frequent modifications during the implementation led to increasing the project cost. The study recommended the following: Attention should be given to project implementation planning, including the social and economical feasibility study and the adoption of scientific methods to ensure the project's success.

KEYWORDS

Project, effectiveness, construction projects, obstacles

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1. Introduction

Managing construction projects faces high risk and difficulty in estimating expectations or problems during the project implementation period, which is the stage in which the work team begins to implement the procedures and tasks agreed upon in the project plan. The implementation stage is the most important stage of project management as it is the stage through which the project works are controlled in accordance with the plan.

1.1 Significance of the Study

The study came out with results and recommendations that lead to improvements in the performance of the project's implementations, which is done by studying and analyzing the obstacles facing the project construction implementations, knowing their causes, and working to address them.

1.2 Limitations of the Study:**Time Limits:** From 2006 up to 2013**Place:** Khartoum State- Sudan

Study Problem: Major construction projects, in order to achieve their objectives, depend on controlling time, cost and quality of project implementation by dealing with the problem resulting from not using modern scientific methods in implementing the project and its impact on achieving project objectives.

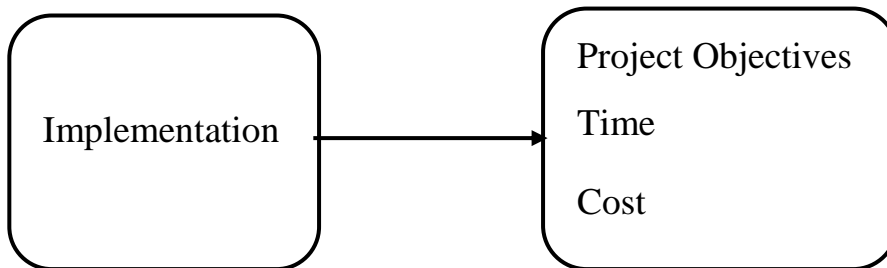
The problem of the study is represented in the following main question:

What is the relationship between the effectiveness of implementation and the achievement of project objectives?

1.3 Study Model

Independent Variable

Dependent Variable

**1.4 Study Hypotheses:**

1. There is a statistically significant relationship between the effectiveness of project implementation and the achievement of objectives.
2. There is a statistically significant relationship between not using scientific methods in implementing projects and achieving objectives.

1.5 Theoretical Significance:

1. Providing the Arabic library with more studies on the obstacles facing project management.
2. The study results give indicators which will serve as a starting point for further studies

1.6 Practical Significance:

This study came out with results and recommendations that contribute to promoting performance in construction companies by identifying the main obstacles facing construction project management, specifying their reasons and solving them.

1.7 Study Objectives:

1. To investigate and analyze the obstacles facing the management of major construction projects in Sudan and hindering projects from achieving their objectives.
2. To identify the scientific methods used in managing major construction projects.
3. To find out defects, identify deviations in the implementation of major construction projects, investigate their causes and clarify the scientific solutions for them.

Study Methodology: The study adopted the historical approach in reviewing the previous studies and scientific sources and references, the deductive approach in investigating the problems and hypotheses of the study, the descriptive analytical approach in collecting and analyzing data indicators of the field study, and the case study approach.

Study Population and Sample: The study population includes all workers in senior and middle management in the field of construction companies investigated. A sample was taken deliberately since the subject of the study is limited to workers in those companies.

2. Previous Studies and Research Methodology:

Wang, Dulaimi and Aguria's (2004) study, entitled: "Risk Management Framework Work for Construction Project in Developing Countries", aimed to identify the difficulties faced by construction companies in developing countries, especially in Singapore, in project implementation, including difficulties at the government level, such as changes in laws, political instability and the difference in culture for international companies. There are other difficulties at the market level, such as a lack of trained manpower,

competition between companies, inflation, and high-interest rates. There are also difficulties at the project level represented in weak project management, lack of company productivity levels, weakness in cash flow, and changes in plans and designs. The study recommended that international contracting companies should pay attention to conditions of working in environments different from their country of origin in order to improve project success.

Lubna Omer Abdel-Halim's (2007) study, entitled: "Evaluating Performance in Building and Construction Projects", investigated the evaluation of the performance problems of building and construction projects and attempted to find solutions to them. The study aimed to analyze the factors affecting performance in building and construction projects in Sudan and to clarify the basic factors that lead to defects in project implementation. The study concluded the findings: The systems controlling the quality of construction projects are vital integrated processes that are not limited to implementation time, but they start at first sight with feasibility and designs study and end with the work process and determination of maintenance tasks. The study recommended that the method of project management should be reconsidered by the total quality, beginning with the feasibility study before the start of the project.

Khalid Abdel-Razek Abu Al-Atham's (2007) study, entitled: "Evaluating Organizational Factors Affecting Contractors' Performance", was conducted in Jordan and applied a case study on 15 governmental construction projects during the period 2000-2004. The study aimed to clarify the impact of environmental and organizational factors on contractors' performance in construction projects considering financial ability and building work teams. Contractors' relations and the environment are independent variables that have an impact on the dependent variables represented in cost, time and specifications. The study concluded that there is a statistically significant impact of the independent variables on the dependent variables. The study recommended that there is a need to provide theoretical and professional knowledge, then develop it through training and establishing regulatory bodies for coordination and follow-up between contracting companies and state-owning agencies.

Yasser Musa Mohammed Ali's (2008) study, entitled: "Administrative Problems Facing Projects in Sudan", aimed to identify the real problems facing project management in Sudan to find out to what extent the weakness of administrators contribute to the failure of projects and delays achieving their objectives, and to determine how projects are managed in developing countries in order to perform the purposes for which they were established effectively. The study also aimed to identify to what extent modern administrative methods and concepts are used in project management. The study concluded the findings: The existing administrative capabilities are weak to manage projects. There are unprecedented deviations in costs and timetables. Project management is unaware of the basics of strategic management.

Eiman Mohammed Ali Mohammad Suleiman's (2011) study, entitled: "Cost and Time Control in Construction Projects", investigated the current situation of the construction industry in Sudan in terms of controlling construction cost, monitoring and controlling the real-time sufficient for the completion of the project. The study aimed to identify the most important methods used in monitoring the progress of implementation works according to the time program and the estimated cost. The study also aimed to identify the methods used in controlling the cost and time of construction projects and to determine the causes that lead to deviation from the cost and time in building and construction projects. The study concluded the following findings: 60% of construction projects suffer from delays due to the lack of a quality control mechanism, the owner represents the cause of the delay and the increase in the cost project by 73% because does not provide the necessary money according to his obligations and adds works during implementation. The delay in making the necessary decisions for the project is one of the reasons leading to project delay. The study recommended the following: A separate trained department should be established to plan, evaluate and control the work in each project. The contract should include a specific period of time that obliges the owner to pay the payments on time in order to avoid delay problems.

Previous studies investigated the impact of various factors on achieving the objectives of construction projects, while this study investigated the impact of implementation on achieving the objectives of the project.

2.1 Theoretical Framework:

Definition of Project: A project is an activity or a group of activities with a specific objective or objectives. These activities are interrelated with each other from the beginning of the project until the end consistently, integrally and logically; this leads to the objective, which is completing the project (Ibrahim, 2000, p. 22).

A project is also defined as an investment process consisting of an integrated set of activities that are implemented within a limited period of time and according to designs and production capacity directed to serve agreed objectives. A project is also usually completed in a relatively long period and has a large budget. This type of project is called mega projects or big projects (Mohammed Al-Hassan, 2007, pg. 53).

Project objectives: There are three dimensions for each project: (Naeem, 2003, p. 12)

1. **Completing the work according to the budget:** The costs represent the budget allowed for the project, which are the target costs for the work, and include all types of project costs that will accumulate, whether they are related to people, equipment, or materials. The cost of each plan or activity and the dependencies of deviation are specified.

2. **Schedule:** It includes the time period during which the work will be completed; it is the most important objective because the requirements may change during the project implementation, but in order to adhere to the specified schedule, we need to manage the project work scope very carefully, develop a plan to control changes that may happen in the scope of work during the implementation and apply control at all stages of implementation.

3. **Achievement requirements:** They represent what we have to do in order to reach the final results; they include the characteristics that should be available in the final product or service, technical specifications and the quality and quantity of the standards used. Therefore, the requirements should be clear and in detail from the beginning because the small details that may not take a long time to be implemented may become inflated and require more time and more labor.

Therefore, the purpose of project management is to direct the project towards an objective that is concerned with three dimensions, but the factors of technical complexity, changing markets, and uncontrolled environmental forces may lead to complexity. The three dimensions are overlapping and should be dealt with simultaneously, as dealing with a dimension individually will lead to a decrease in the other one. When we try to adhere to the timetable and the completion requirements of the project, we will support increasing costs, and vice versa; when we try to fix costs, the quality of work will decrease, the timetable will be delayed, and the quality of completion will decline. In the past, it was allowed to change one or two objectives so that the third most specific one is achieved, while we should focus on the three objectives at the same time and try to find a level of balance between them. From a systemic perspective, project management creates a kind of integration between sources and focuses on a comprehensive perspective of project objectives.

Project Characteristics: The project has a specific task that is to be achieved, whether it is on a large or small level or on a long or short term. Generally, the project can be seen as one unit, but there are some characteristics that differentiate projects. For example: (Samuel Mantell & Jack Nerdet, no date, p. 36)

Complexity: The process of project complexity results from the complexity of the technology provided that depends on the overlapping of tasks, which can result in new and unique problems. **Risk:** Because an organization risks many things when carrying out the project, the project requires special efforts as its failure leads to the organization not achieving its objectives.

Impermanence: Projects are considered temporary activities in which a temporary organization of individuals, materials, and facilities is assembled to achieve an objective within a programmed time frame, and this organization will be dismantled just after the objective is achieved. **Life cycle:** A project passes through several different stages; tasks, personnel, administrative organization, and other resources change with the progress of the project from one stage to the next, and the organizational structure of the project and expenditures grow at each stage until it reaches the peak and then declines until the project reaches the end. **Purpose:** Usually, a project is an activity that happens only once and has a set of desirable final results. **Overlaps:** Projects usually overlap with other ones that the parent organization performs at the same time. But, projects always overlap with the continuous and typical operations of the organization. Although the functional departments of the organization (marketing, financing, manufacturing) overlap with each other in usual typical ways, patterns of the overlap between projects and these departments tend to change. **Unilaterality:** Each project has some elements that are unique and specific. There are no two construction projects that are completely similar and characterized by a certain degree of privacy. **Conflict:** A project manager, more than most managers, lives in a world characterized by conflict. Projects compete with functional departments over resources and personnel, as well as project conflict against other projects over resources within multi-project organizations.

Project Types: (Ismail et al., 2006, p. 18).

There are several divisions of projects, as they are viewed from several aspects. In terms of ownership, projects are divided into three types: public projects, which are represented by the government; private projects, which are represented and owned by the private sector, whether it is (national capitalism or a foreign investor); and the third type of project is the joint sector project whose ownership can be devolved to the public and private sectors. Projects, in terms of their ownership, are also divided into individual ownership or ownership of a joint group between a legal person and the private sector. Projects are also divided according to function or activity into agricultural, industrial or service projects of all kinds. They are also divided into tangible physical projects, such as commodity production projects, including machinery, food, building materials and medicine, and service production projects or service projects, such as banking and educational service projects.

Project Management: (Jim Foiler, 2001, p. 11)

Project management is defined as a set of principles and methods of effective management to perform work that has specific objectives. The project management process includes obtaining benefits from the comprehensive care of the project, project planning, definition and management of the organizational environment within which the project will operate and the management of changes and problems that cannot be avoided during the project implementation, providing customer and management team with information, controlling commitments and obligations so that they can be fulfilled according to the approved schedules and within the budget limits, and the completion and evaluation of the project to reach the final result of the project. Project management takes an active role in planning, controlling, following up, and managing many aspects of work in the project. This knowledge will help the organization to manage the human element, planning schedules, financing, and work quality when starting and implementing work. Project management also provides an approach to forecasting events, which leads to the achievement of tasks. Project management facilitates good communication, problem-solving methods, and analysis skills. It builds within the system the evaluation of project performance compared to the set objectives. Ambitious project implementation of quality in project work is one of the most important outputs of good project management.

There are three constraints imposed on project management, namely: Project field, project budget, and project implementation period. This means that projects should meet stakeholder expectations and be implemented within the budget and time allocated.

2.2 Contracting Stage, Implementation Stage (construction) and Delivery Stage:

Firstly, Contracting Stage: The contracting stage in the construction project begins during the preparation of the last stages of the engineering design stage, as architectural and executive drawings and appendices of the project plans have been prepared, in order to invent quantities and select an appropriate contractor for the project implementation. The contracting stage is considered as a small project for the owner and needs good planning. The most important steps of the stage are preparing the tender documents, presenting the project to contractors for implementation, technical analysis of the offers submitted by contractors, selecting the appropriate contractor and signing the contract (Abdu, 2009, p. 1).

All engineering projects (including building and construction projects) encounter several challenges, which differ from one project to another according to the factors associated with and affecting the project (such as project size, location, duration, and building regulations in the area where the project is implemented). Therefore, such a project needs to be fully managed in order to achieve the objective for which it was established. Contract management is one of the most important stages of project management. It represents the ground on which the contract between the two parties is built, implemented and then delivered. The contract used in construction projects is considered of a special nature as it depends mainly on engineering technical considerations. It is known that most construction projects are implemented by building contractors; therefore, the owner of the project concludes an agreement with the contractor to implement the project according to the specific specifications and drawings, which is known as the construction contract, so that the owner pays financial dues to the contractor according to the terms of the contract in exchange for the latter carrying out the project works and delivering it to the owner in the agreed form. (Khulusi, 1996, p. 17)

Secondly, Implementation Stage (construction): It is the process by which the designers' specifications and plans are transformed into physical entities, organizations and facilities. It includes the organization of all project resources to complete the project on time, according to the budget and standards of quality and performance predetermined by the designer. The basic functions of this stage are carried out by contractors, subcontractors and their employees from construction practitioners and architects. Also, in the field of examination and implementation of the stage works, auxiliary functions are carried out by materials and equipment suppliers, specialized consultants and transport organizations. (Abdellatif, 1994, p. 32).

Implementation Stage includes: The contractor receives the project location according to an official receipt report and equips it with the necessary temporary facilities for subsistence, offices, fences, gates and vital facilities necessary throughout the implementation period. The contractor supplies the resources, including workers, equipment, materials, subcontractors, and the necessary materials to implement all the work items in the contract in accordance with the drawings, specifications, and all the terms of the contract. The owner employs a supervisory body to follow up on the implementation of project work items and ensure that the contractor performs the implementation accurately in accordance with the drawings and specifications and obliges to the contract terms completely. The contractor counts the quantities implemented on the site at time periods specified in the contract and presents them to the supervisory body in order to receive the payment at the contract price in a form known as the current extract.

Construction Stage: It is the most important stage for the owner of the project. This stage falls under the responsibility of the contractor, as he provides the resources necessary for the implementation of the project, including human, financial, materials or equipment, manages and employs them properly by setting a program for the project, developing an appropriate plan to achieve

it and specifying the equipment, materials and labor required for each stage. The contractor should also select the material suppliers correctly in terms of their obligation to supply the required quantities with the agreed specifications in the specified time, as activities overlap and follow each other, and therefore, the provision of materials at the appropriate time saves the time for the rest of the activities. The project management should take into account the points that facilitate work in the project, such as selecting the appropriate place to facilitate the movement of equipment, then fixing them in places that do not hinder the work, selecting the appropriate place to store materials and control over the quantities entering and leaving. (Department of Construction Project, 1429, pg. 4).

The human element is the real capital, which should be well selected, then taken care of and employed in the place appropriate to capabilities. It is important to achieve harmony among individuals and motivate them to exert, cooperate and adhere to work within the team spirit, then follow-up and control to achieve the objectives.

Thirdly, Delivery Stage: It includes notifying the owner written about the completion of the implementation of the work items and requesting the receipt of the project. The owner forms a receiving committee. The receiving committee reviews all the contract documents, including the drawings, specifications and general terms accurately, then checks out the project to ensure that the implementation is performed according to the contract documents. (Construction Projects Department, 1429, p. 10).

The receiving stage is divided into initial receiving and final receiving; the initial receiving is carried out after the completion of the implementation of the work, which is the subject of the contract and the evacuation of the work site of all materials, excess supplies and waste and the completion of its preparation. The instructions for the operation and maintenance of the mechanical and electrical works mentioned in the book of conditions are considered an integral part of the contractor's obligations. The date of provisional receipt is the date of completion of these works. A committee of representatives of the consultant and the employer shall inspect the work at the date specified by the contractor and prepare the preliminary receipt report with the signature on the record by the representatives of the consultant and the employer and by the contractor or his representative. Based on the inspection, if it appears that the work has been completely implemented as required, the initial receipt will be made. But, if it appears that the work has not been completed as required, a case record is made showing all the works delay their cost and receiving is postponed until the works are performed in accordance with the contract. If it appears that the work has been implemented as required, the date originally set by the contractor for the initial receipt shall be deemed the date of the end of the work and the start of the warranty year. (Gomaa, 2005, pg. 68)

Final Delivery: If the contractor fulfils all obligations in accordance with the terms of the contract, the final delivery shall take place after one year from the date of the temporary delivery; otherwise, it shall be postponed until the implementation of all obligations imposed on the contractor according to the contract which makes the consultant satisfied. The guarantee period shall be extended accordingly. The final delivery is evidenced by a record signed by the consultant and the employer; a copy of it is given to the contractor, and the consultant has the right to examine or inspect the works before the final delivery in order to verify that the contractor has fully implemented his obligations, and he pays the contractor due amounts and refunds the final insurance while letters of guarantee are returned to the bank. (Gomaa, 2005, p. 71).

2.3 Stages and Procedures of the Applied Study:

Firstly: Validity and Reliability

The validity of the measurement tool means that the tool is able to measure what it was designed for. Based on the theory of correct measurement, complete validity means that the tool is free from random or regular measurement errors. In order to test the validity statistically, factor analysis is used to test the possibility of collecting data and representing them in a factor or several factors, and then the objective is to test the degree to which the data represents the expected structure.

To verify the reliability of the scale, Cronbach's alpha method was adopted to ensure the internal consistency of the scale and Cronbach's alpha coefficient values ranging from zero to one.

Table (1): Cronbach's alpha test results for the variable implementation scale

Statements	Cronbach's alpha
1-Project management takes into account accuracy in setting project implementation schedules.	0.82
2-Projects lack managerial cadres who have experience in implementation.	0.85
3- Project management lacks highly efficient technical and financial cadres.	0.85
4- Project management lacks highly productive technical and financial cadres.	0.85

5- Project management does not give attention to developing managerial and technical abilities through training programs and applied workshops.	0.86
6- Project management adopts proper principles in selecting an efficient contractor.	0.85
7- Government policies and decisions affect the time period required for project implementation.	0.85
8- Project management adheres to the technical specifications specified for implementing the project.	0.85
9-Projects suffer from frequent modification of specifications after the start of project implementation.	0.86
10- Subcontractors' delays have a major role in delaying the project implementation.	0.86
11. Projects lack effective communication within the project team.	0.85
12- Projects suffer from poor coordination between the project parties (contractor - owner - consultant).	0.85
13- Projects suffer from poor coordination between the project parties (contractor - owner - consultant) and the parties related to the project (subcontractors - suppliers).	0.86
14- Project management delays in making decisions regarding project implementation.	0.85
15- The owner is not committed to the payment program and the cash flow time according to the implementation programs.	0.85
16- Projects suffer from the weak technical and financial potential of the contractors.	0.85
17- Projects suffer from the complexity of the managerial and legal procedures of the project implementation.	0.81
Total	0.87

Source: Prepared by the researcher based on the analysis results

Table (1) above shows the reliability test results. Cernbach's alpha values for all statements of the implementation variable are greater than (60%); these values mean that there is a very high degree of "internal reliability" for all statements, whether for each statement separately or at the level of all statements of the scale, as Cernbach's alpha value for the total scale was (0.87), which is considered high reliability. Therefore, the scales on which the study relied in measuring the implementation variable are characterized by the internal reliability of the statements; this enables to rely on the responses in achieving the study objectives and analyzing its results.

Secondly: Statistical analysis of the study statements: This is done by calculating the mean and standard deviation for all study aspects to identify the direction of the study sample and to rank the statements according to their relative importance.

The chi-square test was adopted to verify the study hypotheses in order to find out the significance of the differences between the statements of study hypotheses.

Table (2): Frequency distribution of the aspect implementation statements

Statement	Strongly agree		Agree		Neutral		Disagree		Strongly disagree	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
1-Project management takes into account accuracy in setting project implementation schedules.	15	17.4	44	51.2	11	12.8	10	11.6	6	7
2-Projects lack managerial cadres who have experience in implementation.	13	15.1	23	26.7	25	29.1	22	25.6	3	3.5
3- Project management lacks highly efficient	10	11.6	27	31.4	24	27.9	20	23.3	5	5.8

technical and financial cadres.										
4- Project management lacks highly productive technical and financial cadres.	13	15.1	22	25.6	26	30.2	23	26.7	2	2.3
5- Project management does not give attention to developing managerial and technical abilities through training programs and applied workshops.	19	22.1	28	32.6	10	11.6	24	27.9	5	5.8
6- Project management adopts proper principles in selecting an efficient contractor.	14	16.3	38	44.2	20	23.3	9	10.5	5	5.8
7- Government policies and decisions affect the time period required for project implementation.	45	52.3	31	36	7	8.1	3	3.5	0	0
8- Project management adheres to the technical specifications specified for implementing the project.	22	25.6	45	52.3	10	11.6	6	7	3	3.5
9-Projects suffer from frequent modification of specifications after the start of project implementation.	32	37.2	33	38.4	14	16.3	6	7	1	1.2
10- Subcontractors delay has a major role in delaying the project implementation.	38	44.2	38	44.2	7	81	3	3.5	0	0
11. Projects lack effective communication within the project team.	7	8.1	38	44.2	16	18.6	20	23.3	5	5.8
12- Projects suffer from poor coordination between the project parties (contractor - owner - consultant).	13	15.1	32	37.2	13	15.1	26	30.2	2	2.3
13- Projects suffer from poor coordination between the project parties (contractor - owner - consultant) and the parties related to the project (subcontractors - suppliers).	7	8.1	38	44.2	14	16.3	24	27.9	3	3.5
14- Project management delays in taking decisions regarding project implementation.	7	8.1	29	33.7	20	23.3	25	29.1	5	5.8
15- The owner is not committed to the payment program and the cash flows time according to the implementation programs.	29	33.7	33	38.4	10	11.6	10	11.6	4	4.7

16- Projects suffer from weak technical and financial potential of the contractors.	17	19.8	33	38.4	7	19.8	17	19.8	2	2.3
17- Projects suffer from the complexity of the managerial and legal procedures of the project implementation.	17	19.8	43	50	11	12.8	15	17.4	0	0
Total	318	21.8	575	39.3	245	16.8	263	18	51	3.5

Source: Prepared by the researcher based on the analysis results

Table (2) above shows the sample respondents to the aspect implementation statements:

1. Most of the sample respondents (68.6%) agree that (Project management takes into account accuracy in setting project implementation schedules). (18.6%) of them disagree, and (12.8%) did not give a specific response to the statement.
2. Most of the sample respondents (41.8%) agree that (Projects lack managerial cadres who have experience in implementation). (29.1%) of them disagree, and (29.1%) did not give a specific response to the statement.
3. Most of the sample respondents (43%) agree that (Project management lacks highly efficient technical and financial cadres). (29.1%) of them disagree, and (27.9%) did not give a specific response to the statement.
4. Most of the sample respondents (40.7%) agree that Project management lacks highly productive technical and financial cadres). (29%) disagree, and (30.2%) do not give a specific response to the statement.
5. Most of the sample respondents (54.7%) agree that (Project management does not give attention to developing managerial and technical abilities through training programs and applied workshops). (33.7%) of them disagree, and (11.6%) did not give a specific response to the statement.
6. Most of the sample respondents (60.5%) agree that (Project management adopts proper principles in selecting an efficient contractor). (16.3%) of them disagree, and (23.3%) did not give a specific response to the statement.
7. Most of the sample respondents (88.3%) agree that (Government policies and decisions affect the time period required for project implementation). (3.5%) of them disagree, and (8.1%) did not give a specific response to the statement.
8. Most of the sample respondents (77.9%) agree that (Project management adheres to the technical specifications specified for implementing the project). (10.5%) disagree, and (11.6%) did not give a specific response to the statement.
9. Most of the sample respondents (75.6%) agree that (Projects suffer from frequent modification of specifications after the start of project implementation). (8.2%) of them disagree, and (16.3%) did not give a specific response to the statement.
10. Most of the sample respondents (88.4%) agree that (Subcontractors delay has a major role in delaying the project implementation). (3.5%) of them disagree, and (8.1%) did not give a specific response to the statement.
11. Most of the sample respondents (52.3%) agree that (Projects lack effective communication within the project team). (29.1%) of them disagree, and (18.6%) did not give a specific response to the statement.
12. Most of the sample respondents (52.3%) agree that (Projects suffer from poor coordination between the project parties (contractor - owner – consultant). (32.5%) of them disagreed, and (15.1%) did not give a specific response to the statement.
13. Most of the sample respondents (52.3%) agree that (Projects suffer from poor coordination between the project parties (contractor - owner - consultant) and the parties related to the project (subcontractors – suppliers). (31.4%) of them disagree, and (16.3%) did not give a specific response to the statement.
14. Most of the sample respondents (41.8%) agree with that (Project management delays in taking decisions regarding project implementation). (34.9%) of them disagree, and (23.3%) did not give a specific response to the statement.
15. Most of the sample respondents (72.1%) agree with that (The owner is not committed to the payment program and the cash flow time according to the implementation programs). (16.3%) disagree, and (11.6%) did not give specific responses to the statement.
16. Most of the sample respondents (58.2%) agree with that (Projects suffer from the weak technical and financial potential of the contractors). (22.1%) of them disagree, and (19.8%) did not give specific responses to the statement.
17. Most of the sample respondents (69.8%) agree with that (Projects suffer from the complexity of the managerial and legal procedures of the project implementation). (17.4%) of them disagree, and (12.8%) did not give specific responses to the statement.

Most of the sample respondents (61.1%) agree with all statements of the aspect (implementation). (21.5%) of them disagree, and (16.4%) did not give specific responses to the statement.

Secondly: Descriptive analysis of the aspect implementation statements**Table (3): Mean, standard deviation, relative significance and ranking of the scale statements**

Statement	SD	Mean	Sig.	Rank
1-Project management takes into account accuracy in setting project implementation schedules.	1.11	3.60	Agree	7
2-Projects lack managerial cadres who have experience in implementation.	1.10	3.24	Neutral	16
3- Project management lacks highly efficient technical and financial cadres.	1.10	3.20	Neutral	15
4- Project management lacks highly productive technical and financial cadres.	1.08	3.25	Neutral	14
5- Project management does not give attention to developing managerial and technical abilities through training programs and applied workshops.	1.26	3.39	Agree	10
6- Project management adopts proper principles in selecting an efficient contractor.	1.06	3.55	Agree	8
7- Government policies and decisions affect the time period required for project implementation.	0.902	4.34	Strongly agree	1
8- Project management adheres to the technical specifications specified for implementing the project.	0.982	3.89	Agree	4
9-Projects suffer from frequent modification of specifications after the start of project implementation.	0.963	4.03	Agree	3
10- Subcontractors delay has a major role in delaying the project implementation.	0.764	4.29	Strongly agree	2
11. Projects lack effective communication within the project team.	1.08	3.26	Neutral	13
12- Projects suffer from poor coordination between the project parties (contractor - owner - consultant).	1.13	3.32	Neutral	11
13- Projects suffer from poor coordination between the project parties (contractor - owner - consultant) and the parties related to the project (subcontractors - suppliers).	1.06	3.26	Neutral	12
14- Project management delays in taking decisions regarding project implementation.	1.09	3.09	Neutral	17
15- The owner is not committed to the payment program and the cash flows time according to the implementation programs.	1.15	3.84	Agree	5
16- Projects suffer from weak technical and financial potential of the contractors.	1.09	3.53	Agree	9
17- Projects suffer from the complexity of the managerial and legal procedures of the project implementation.	0.978	3.72	Agree	6
Total	1.05	3.58	Agree	

Source: Prepared by the researcher based on the analysis results

Table (3) above shows the following:

1. All the statements that express the aspect (implementation), their mean are greater than the hypothetical mean (3); this result indicates the agreement of the respondents with all the statements that measure the implementation.
2. The most important statement of the aspect (implementation) is the statement (Government policies and decisions affect the time period required for the project implementation); the mean of the sample individuals' responses to the statement was (4.34) and the standard deviation was (0.902) followed by the statement (Subcontractors delay has a significant role in delaying the project implementation) with mean of (4.29) and a standard deviation of (0.764). The lowest statement in terms of the sample agreement (Project management delays in making decisions related to the project implementation) with a mean of (3.09) and a standard deviation of (1.09).
3. The mean of all statements was (3.58) with a standard deviation of (1.05); this indicates that the majority of the respondents agree with all statements of the aspect implementation.

3. Findings

1. The implementation phase of the project is the most important phase, as it constitutes more than 85% of the project's total cost.
2. The limited available resources, including materials, skilled labor and equipment, is one of the most important problems facing construction project management.
3. The governmental procedures related to the degree of safety in designs and methods of performing construction operations are the most important problems facing construction project management.
4. Project management is based on three main aspects: time, cost and quality.
5. The study showed that subcontractors have a major role in delaying project implementation.
6. Project management ensures that the implementation is carried out at high quality levels in accordance with the technical specifications of contract implementation.
7. The study revealed that the frequent modifications during the implementation lead to increased project costs.
8. Projects suffer from delays in taking decisions related to project implementation.

4. Conclusion

*The present study attempts to identify the impact of effective implementation on construction projects in Sudan as well as its administrative processes and characteristics.

*Studying and analyzing the obstacles facing the implementation of construction projects, searching for their causes, and providing scientific solutions to them.

*Finding a correlation between effective implementation and achieving project goals.

*Learn about the scientific methods used in the implementation of projects.

*Identifying the main problems facing project management.

This study finds that there is a relationship between effective implementation and achieving project goals. The project implementation stage is the most important stage of the project, which represents more than 85% of the project cost. It also finds that the subcontractors play a major role in delaying the implementation of the projects. Also, projects suffer from decision delays related to project implementation, and frequent modifications during implementations lead to an increase in project costs.

The need for further studies was seen as important in the following;

*The impact of technical obstacles facing the application of technical aspects in the implementation of new projects.

*The cost control and the time required to implement projects using modern scientific methods.

*The role of engineering consultants in achieving the objectives of construction projects.

4.1 Recommendations:

1. Attention should be given to technical and technological education by establishing technical institutes and specialized technological colleges to provide skilled labor in all fields.
2. Attention should be given to the planning of project implementation, including economic and social feasibility studies and the adoption of scientific methods in order to ensure the project's success.
3. Modern scientific methods should be used in project implementation, such as the network planning method.
4. Harmony and teamwork spirit should be achieved among the team working on the project.
5. A clear vision for financing should be set before the start of project implementation.
6. Designs should be reviewed before starting project implementation to avoid frequent modifications during the implementation.
7. The owner should be obliged to pay the payments in order to avoid the problems of delaying the project implementation.
8. Attention should be given to rapid communication between various project parties and consultants in order to implement the project within the specified time frame.

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