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عنوان البحث

Improve the construction project

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Dedication

I dedicate this work to all colleagues in study and work

Thanks and appreciation

Special thanks to the family of Midocean University, College of Management, and special thanks to their Excellency Dr. Alfaisal Abdelhameed and Dr. Fayez Ali who supervised this work.

Abstract

The study aimed to identify the effect of improving the construction project by applying it to Midrar and PRESCO companies, in order to identify the impact of their application of this technology and to what extent it affected the reduction of waste in materials and resources and benefit from time in the completion of projects and to identify the feasibility of the project management process, which is considered the basis of success projects recently.

Table of contents

No	Topic	Page No
1	Chapter one General framework of the research	8
2	1 .Introduction	8
3	2 .Research problem	8
4	3 .Research objectives	9
5	4 .Research questions	9
6	5 .Methodology	10
7	6 .The overall structure of the study	10
8	Chapter 2 :Literature review and previous studies	11
9	Introduction	11
10	What is Building Information Modeling (BIM)?	12
11	1 .Improve communication	12
12	2 .Early detection of problems	13
13	3.Greater transparency	14
14	4.Joint responsibility	14
15	5.Data-driven informed decisions	15
16	6.Benefits of project control	15
17	Here are some of the key benefits of project control:	16
18	Previous studies	17
19	Comment on previous studies	22
20	Chapter 3	23
21	Methodology	23
22	Introduction	23
23	The method used in the study	23
24	1.Midrar Company	24

25	2 .PRESCO company:	25
26	The study sample	26
27	Definition of methodology	27
28	The limits of the study	28
29	Chapter 4: Analysis and study	29
30	Engineering Project Management Operations:	29
31	Recognized project management software	31
32	1 -Primavera	31
33	2 -Value Stream Mapping	33
34	3 -Kaizen	34
35	4-JIT	35
36	5-Building Information Modeling:	37
37	Project management system in Midrar Company	40
38	Project management system in PRESCO Company	40
39	Chapter 5: Results, recommendations, and conclusion	42
40	Results	42
41	Recommendations	44
42	Conclusion	45
43	References	46
44	Appendices	48

Table of figures

No	Figure	Page No
1	Figure (1) VSM	26
2	Figure (2)	28
3	Figure (3) Follow-up material by Primavera	32
4	Figure (4) Follow up on materials via value stream map	33
5	Figure (5) Kaizen process	35
6	Figure (6) JIT approach	37
7	Figure (7) BIM diagram	38

Chapter one

General framework of the research

1. Introduction

In construction projects, numerous issues arise affecting the project's process as well as its progress that ultimately affect quality of the project. Construction projects are not only about to build the buildings correctly, but also an efficient management and execution of its constituent processes. As the construction projects need a high level of quality, these must be done with carefully planned management and controlled process. Various process tools and techniques are used to minimize the issues from beginning to the end of projects. Six Sigma has many tools that help to increase the quality of process. We use aforementioned tools in a construction project management: Value Stream Mapping, MUDA, Kaizen, JIT and GEMBA. Value Stream Mapping is one of the quality techniques used to find all the value adding and non-value adding activities in a process from raw materials to end-customer. MUDA is used to the activities without adding value for the projects. Kaizen is changed for betterment or improvement. Using JIT to schedule the steps of the project to be on time. GEMBA is one of the best tools used in an actual place, used for shop floor. In this research, these tools and techniques are employed and compared to help improve the construction process in order to avoid poor quality, waste time, and waste cost and wasted effort.

2. Research problem

The research problem is that construction projects are dealt with without scientific methods, and this is done through the operations of traditional contractors and without reference to scientific methods in project management operations. Through this

research, the researcher will try to identify the most important problems facing projects and how to overcome them by scientific methods. Managing construction projects.

3. Research objectives

This research paper aims to improve the performance of building and construction projects in the Kingdom of Saudi Arabia and reduce waste in construction projects by applying the concepts of lean construction through:

1. Identify the main causes of waste in the Saudi construction industry and present techniques that reduce and control waste to prevent and eliminate the causes of waste inherent in the construction process.
2. Identify the benefits of using Lean Construction, better understand how to implement Lean Construction, and encourage the construction sector to apply construction project optimization concepts in resource and project management.
3. The results of this study aspire to draw attention to lean construction and to improve the construction project.

4. Research questions

- 1 .How to improve your planning?
- 2 .How to find good construction management software?
- 3 .How to start using Building Information Modeling (BIM)?
- 5 .How to invest in training?
- 6 .How to improve your communication?
7. How to do establish performance measurements, and hold your crew accountable?.

8. How to implement prefabrication and modular construction into your projects.?

5. Methodology

Based on the research problem and the answer to the research questions formulated by the researcher above, and to achieve the research objectives, the inductive-deductive approach is followed, through extensive research in the literature to show the benefits achieved from applying the concepts of improving the construction project, and information was collected from many primary and secondary sources. This is done by extrapolating and analyzing previous studies and literature, books and periodicals that are related to the field of study, in order to identify the theoretical basis for improving the construction project, its causes, types and techniques used in detecting and controlling it.

6. The overall structure of the study

1. The first chapter is the research plan.
2. The second chapter is represented in the literature of the study and previous studies.
3. Chapter Three Methodology and Analysis.
4. The fourth chapter summarizes the findings and recommendations.
5. References.
6. Appendices.

Chapter 2

Literature review and previous studies

Introduction

The success of a construction project depends on the contractor's commitment to incorporating quality control into every phase of construction. To achieve this, it must be ensured that all project teams comply with the project's regulations, codes, and quality assurance standards.

Quality control plays a critical role in construction projects, helping to ensure that the project meets the required quality and durability standards. In the absence of good quality control, this can lead to many problems, including project delays, increased costs, defects in structure and design, loss of invested money, and loss of confidence in the project. Therefore, quality control is a vital part of any construction project, and helps achieve optimal performance and desired results.

Construction quality management has come a long way from relying entirely on traditional checks and inspections either on site or at the completion of a project which often ignores many major issues which are addressed only when accidents occur. Construction quality management is now more comprehensive and relies on data-driven digital tools. This allows contractors to reduce construction hurdles and prevent the need for rework. Among these digital tools – Building Information Modeling (BIM) – can be used to improve construction quality control. (Amina and others ,2021)

What is Building Information Modeling (BIM)?

Building Information Modeling (BIM) is the process of designing and managing construction projects using a digital model of an integrated set of project-related information. A BIM model is created by entering multidimensional data into the digital model, allowing the project team to identify and interact with minute details before the actual construction process begins.

A wide range of information is included in a BIM model, such as engineering design, costs, schedule, and engineering and other details of materials, processes, and designs. BIM is continually updated throughout the project lifecycle, allowing the owner, engineers, contractors, and other project stakeholders to update information and handle changes optimally.

BIM technology helps improve project management, increase productivity efficiency, and reduce losses and errors in construction and maintenance operations. It also helps to improve the cooperation between the different work team, maintain the quality of the project and meet the requirements of the client. Here are some of the benefits of using Building Information Modeling (BIM) in improving quality control in construction. (Amina and others, 2021)

1. Improve communication

The use of Building Information Modeling (BIM) technology helps enhance collaboration and coordination among all project participants, including designs, contractors, and owners. By creating a digital model of the building, all team members can visualize and understand the project in a common language, reducing the risk of errors and misunderstandings. In addition, with construction project management

software, any critical information that requires immediate action can be conveyed faster.

Integration of BIM with the construction project management software helps to share all information, data, and ideas in real time among all those working on the project. This can help ensure that all parties involved in the project comply with the quality standards and expectations of the project. (Irfan Ullah ,2020)

2. Early detection of problems

BIM capabilities go beyond illustration and 3D modeling, as it can be used for other purposes such as defect detection and building performance analysis during the design phase. By containing all the information related to the different systems in the building, the Building Information Model (BIM) can be used to standardize the designs of these systems, thus facilitating the detection of any conflicts between them by contractors. For example, if the model reveals a conflict between the plumbing and electrical systems, the designs can be modified quickly to avoid any problems in the future, and this reduces the need to redo the work again to modify the building.

Discovery BIM technology can be used to analyze energy consumption, lighting, and acoustics. These capabilities are vital in identifying potential problems in building systems early in the design process, providing an opportunity to make the necessary changes to improve building performance. In addition, BIM-based collaboration improves communication between stakeholders, helping construction teams discover and resolve potential issues faster, thus reducing the risk of rework or project delays. (Samuel and others ,2020)

3.Greater transparency

Collaboration and accountability among team members are critical to achieving the required quality standards in a construction project. The Building Information Model (BIM) provides a digital model containing a large amount of building data and information that can be accessed by all project stakeholders, contributing to accountability and transparency.

Everyone involved in the project can access the same information, which creates an interactive and sharing environment among the team. Using a common digital model of the building also facilitates understanding of the role and responsibilities of everyone on the team, helping to reduce confusion and ensuring that required standards of quality are met. When everyone has a defined role in quality control, they are more likely to be committed to their tasks and to strive for significant quality improvement. (Irfan Ullah ,2020)

4.Joint responsibility

Each team is expected to take responsibility for its own work, including possible errors that could lead to the need for repairs or rework. This ensures that everyone does his or her best on the construction site. But it should be noted that the main reason for making efforts is to influence the work of others. Hence, it is everyone's responsibility to ensure and control quality in construction projects.

This culture starts at the top management and extends to the different project teams. Thanks to the Building Information Model, the project team can collaborate more freely and share responsibility better. This makes it easier to identify and address problems that may arise. In addition to reducing the potential for blame, it encourages

collaboration and a focus on solutions. Ultimately, quality assurance teamwork ensures that projects are successful and completed on time and within budget. (Samuel and others ,2020)

5.Data-driven informed decisions

Improving the quality of the final product in the construction industry requires hard work and effective collaboration among all stakeholders. However, in the past, project quality improvement and quality control relied on a few experts in the industry independently deciding the appropriate procedures and following up on their own implementation. However, this led to results of varying quality and individual opinions and experiences were often ignored.

However, with the development of Building Information Modeling (BIM) technology, this dynamic has changed and teamwork has become more effective and inclusive. BIM is based on 3D modeling, which allows engineers, contractors, architects and all stakeholders to work on the same unified platform. This enables stakeholders to share data more effectively and work together to create a single model that encompasses all aspects of the project. Those responsible for quality can analyze available data and information and identify potential risks and sensitive points in a construction project. By analyzing these risks and identifying sensitive points, the work team can make the right decisions to prevent problems and errors.

6.Benefits of project control

On megaprojects, various contingent variables can create great difficulty in keeping the project progress plan in line with the initial plans. However, careful monitoring,

analysis and regular can keep this under control. Projects of all sizes, not just large ones, bring many benefits when the project is properly controlled. (Samuel and others ,2020)

Here are some of the key benefits of project control:

1. Lower project costs through the ability to make timely decisions using key performance indicators.
2. Increased predictability of project progress in terms of cost and completion date.
3. Increase clarity in project financial statements at all stages.
4. The ability to mitigate project deviation from its original track.
5. Reference data to be used in future projects through well-organized projects.
6. Increase profit margins when repeating the same project in a fixed-price market.
7. An established reputation for properly managing and controlling projects.
8. Competitive advantage over organizations with less mature project management capabilities.
9. Increase job satisfaction for project team members.
10. Despite best efforts and intentions - many organizations find that large-scale projects fail to achieve their objectives for a number of reasons:
11. Excessive optimism, errors of manual estimation, insufficient historical data, derailment of the original project path, and many other factors.(Hazır, 2015)

Previous studies

1. Study Amina and others (2021) titled in Improving Performance in Construction Projects: A Case Study of Malaysian Public Projects.

Measures are in place to curb underperformance. However, due to the different architectural cultures of various countries, the actual reasons are difficult to verify. This research aims to develop a framework to alleviate the problem of inducing poor performance through a novel classification. In SPSS, an empirical analysis of the mean and Relative Importance Index (RII) of data collected from 56 public projects in Malaysia from 2003 to 2014 was conducted. Qualitative and quantitative data were analyzed from auditor general reports, interviews, pilot surveys and comprehensive expert surveys. The study found that the most influential factors affecting underperformance were actually independent of the factors examined in the Auditor General's report, with a few exceptions. Furthermore, the findings concluded that associated financial issues and the construction phase in the project life cycle contributed to poor performance. Develop and validate potential mitigations in targeted group discussions with experts. Ultimately, a framework emphasizing competency, engagement, communication, facilitation and collaboration (5Cs) was developed to mitigate poor performance. The study was limited to identifying factors that contributed to poor performance.

2. Study David (2015) titled in productivity Improvement in Construction Project Delivery, Federal University of Technology, Akure.

Productivity is a complex phenomenon at all levels, be it individuals, the organized private sector, and in all spheres of human activity, especially in the execution of construction projects. There are many reasons for low productivity in the construction

industry, such as: a sharp decline in the skill level of construction workers, shift work, material and equipment shortages, change orders, labor shortages, weather, lack of supervision and control of projects, etc. Analyzes the key factors leading to increased productivity in the implementation of construction projects. This includes project planning, measuring productivity, avoiding congestion on construction sites, motivating employees and communicating well, among others. Therefore, it is advisable to consider time management, application of project management tools (e.g. expert masters, priority charts), research and development, provision of new equipment, plant and machinery to replace old equipment, simplification of product assortment and overall efficiency the details of best practice will undoubtedly increase the productivity of construction project execution..

3.Study Samuel and others (2020) improving construction project performance in development countries .

Project success remains the goal of every project sponsor. To do this, the promoters employ various professionals in the built environment. However, unforeseen factors changed the agreed terms, causing delays and wasted time and money. Delays can lead to cost and time overruns and place a heavy financial burden on clients and other stakeholders involved in the project. In most cases, the contractor is at the center when this happens. In many other cases, other stakeholders who failed to meet their obligations only emerged after a review of the terms of the contract. Therefore, this study examines project performance in the Nigerian construction industry from a contractor's perspective. The study is based on a survey research design. A total of 75 questionnaires were distributed to contractors who are members of construction trade associations and other private sector organizations, but 37 were successfully retrieved and analysed. The results show that in order to improve the performance of construction

projects in developing countries, the following issues need to be addressed: design and installation issues, payment issues, and construction difficulties due to incomplete consultant designs. The study recommends, among other things, that contractors be involved early in the project planning phase and introduce BIM, which is not yet widely used in the industry.

Study Pontus Urbán (2019)Improvement Strategies in Construction Sites, Development of Rapid Site Assessment for House-building Industry. Luleå University of Technology, Department of Civil, Environmental and Natural Resources Engineering.

The construction industry has gone from bad to worse over the past 40 years. Up to 35% of production costs are due to waste. Manufacturing has experienced the opposite trend, in many cases thanks to the contributions of lean manufacturing and various assessment tools. The assessment tool assesses how well a manufacturing company is implementing Lean, from which improvement strategies can be developed. The aim of the master's thesis is to develop an assessment tool that can be used to evaluate emerging lean constructions in the industry. The assessment tool is called Rapid Site Assessment (RSA).

The basis of the RSA is the Rapid Plant Assessment (RPA), which is conducted through short plant visits by a team of experienced researchers. The 20 polar issues are correlated and assessed in 11 categories to determine the potential of the system and develop improvement strategies. Five other assessment tools combined with RPA and validated with Lean Construction and Lean Reference.

The master's thesis is exploratory, using a deductive approach to gather qualitative data. The assessment tool based on literature research was tested on six different housing

construction sites. Validity was ensured through triangulation, checking supervisors, and six different field tests. Reliability is ensured through demarcation of work areas, careful documentation and regular consultation with the help of experienced managers. The result is the RSA, which contains 32 statements related to 11 categories: customer satisfaction; safety, environment, cleanliness and order; visual management; planning systems; inventory levels, space utilization and material movement; teamwork and motivation; Condition and maintenance of equipment and tools; management of complexity and variability; supply chain integration; commitment to quality; commitment to continuous improvement.

Six site selection tests showed potential for growth in the residential construction industry. Interviews and RSA scores are broadly similar. Analysis showed that while the RSA tests captured these locations, they were not comprehensive enough to fully understand them. The assessment must be further developed and the assessment tool expanded to include additional interviews. These categories are mostly related, but interviews must be added to reduce bias, although this will include interpretation of the project by more people. Comparing the views of different professions adds credibility. This can solve the problem that most of the data is collected through communication with a few people in the field rather than observation. Also, some statements fall into too many categories and may be broken down.

The master's thesis plan is very thoughtful, but there are a few points that I have to talk about. The work was done independently, and the assessors were inexperienced with the system and the construction site, which made the assessment difficult. Solve problems through the experience feedback of the research group and tutors. Finally, RPA was considered repetitive; this resulted in repeated RSAs, but this was not considered a problem, although different analyzes were performed on different

categories of data. However, repetition can make it difficult to produce valid reports, which can affect readers' perceptions of credibility. In the future, RSA will be developed for different types of construction projects, road works, industries, etc., and tested by other researchers to increase its credibility.

The master's thesis showed that RSA could be developed through a combination of evaluation tools, although it cannot be done in a short time. With the addition of interviews, solid improvement strategies can be developed from RSA.

Study Irfan Ullah (2020) Study of Factors Causing Time and Cost Overrun t Cost and time overrun are the key troubles of any improvement ventures.

These problems are taking a dire toll and prosperity. To overcome these issues, this paper investigates the pervasive influence of factors that contribute to task delay and cost. A survey review of the situation studies was carried out, covering various methods of gathering information. The results of the background check revealed the most compelling factors in Malaysia:

1) Inadequate contractor planning, 2) poor board placement, and 3) inexperienced contractors were the most important factors. The paper also breaks down the normal and least efficient shift variables that lead to task delays and cost overruns in Malaysia. It can also be inferred from this that various component shifting measures exist in the development industry to reduce the impact of task shifting and cost overruns. There are some important factors in controlling timeouts, understanding and managing these factors will have a significant impact on the speed of improvement and may not result in capacity recovery. Thirty (30) major development extensions in Malaysia are

excellent enough to handle timeouts at any given point in development. Among the 30 projects, 17 (56.67%) project start-up time exceeded 1100 days, 5 (16.67%) projects were delayed between 160 and 200 days, 5 (16.67%) projects were delayed in three (10%) during the delay of 201 to 300 days The project has been delayed for more than 300 days. The entire construction project life cycle, Dalian University of Technology.

Comment on previous studies

Through our review of previous studies, which dealt with the issue of improving the construction project from various angles and topics, but all of them were concerned with studying issues or variables that dealt with the aspect of improving construction projects and how to benefit from time and effort, with the help of project management programs, through technology.

Chapter 3

Methodology

Introduction

The main reason behind preparing this research article is that it will enable me to remove one of the defects that appear in the project management system in the companies under study. Accordingly, I have committed myself to follow the required steps in the Defect Removal Mapping Checklist. Therefore, I succeeded in providing this specific work as needed.

In the task above, I discussed problem solving, decision-making, conflict resolution, consensus building, brainstorming, team meetings, and managing team communications. In addition, I have provided a short summary of the entire topic, discussion, and reflective writing..

The method used in the study.

Reliance would be made, as we explained, on the inductive descriptive approach, by studying the project management system in some companies that manage large projects in the country, and then we will review the scientific methods that they follow, by reducing waste in materials and reducing cost and time for large projects in order to achieve the highest amount To take advantage of the available resources for projects in the Kingdom of Saudi Arabia. The study was applied to two companies, as their information is shown in the following:

1.Midrar Company:

History of Success: Midrar is a prominent Saudi Company founded in 2007 to serve the ever-growing Real Estate Development Market. Pioneering the concept of excellence, Midrar provides a full-fledged range of Development Management Services to a widely diversified network of Real Estate Developers throughout out the Kingdom.

a.Development Management Services: Midrar’s specialists provide the most cost effective and efficient solutions for your Real Estate Development Projects. We analyze your targeted business plans while proactively and strategically manages all aspects of your project from inception to completion.

b.Project Management Services: We provides a comprehensive range of products and techniques to create value for the construction industry and support sustainable development.

c. Design management.

The company carries out design management operations for projects and supervises implementation operations for projects after conducting design operations and ensuring that implementation conforms to previously established designs to ensure the quality of project implementation.

d. Construction supervisor.

Construction supervisors are responsible for the management and safety of construction projects. Through planning, organizing, and controlling projects, they create an efficient and safe workplace, including materials and personnel.

e. Construction management.

Project management according to the Project Management Association (PMA) is the application of processes, methods, skills, knowledge and experience to achieve defined project objectives according to project acceptance criteria within agreed upon standards. Project management has products that are constrained by a limited time period and budget.

2. PRESCO company:

Company profile: Providing renowned Light Gauge Steel (LGS) building solutions, PRESCO LGS offers unparalleled quick, reliable, and automated production and construction capabilities. This eliminates the requirement for skilled labor, whilst securing a quicker project completion date without compromising superior quality for our clients. It's the new technological revolution in construction industry.

PRESCO is a company specialized in providing modern and smart solutions to the construction sector and providing modern building products to the Saudi market, with high quality and reasonable cost and in a short time compared to traditional construction, in accordance with the requirements of the Saudi Building Code for steel buildings, and we use in this construction modern technology that depends on steel, which is light iron as the basis for the structure instead of using concrete and iron bars,

Through these companies, each company's project management system will be reviewed, then the most important problems facing each of the companies' systems under study will be identified through analysis and study, and the strengths and weaknesses of each system will be known.

community of study The study population is represented by companies working in project management in the Kingdom of Saudi Arabia, in Jeddah.

The study sample

A random sample of Project management companies will be selected from these companies that work in the field of project management in order to identify the nature of their project management and how they follow the scientific methods mentioned in the research, by reducing costs and conserving resources.

The researcher will analyze and study the content of project management for two companies working in the field of project management, namely Midrar company and

PRESCO Company, which works in the field of consulting and project monitoring

Where the feasibility of the methods used in the project management system will be identified. The programs used by companies, which are Value Stream Mapping, MUDA, Kaizen, JIT and GEMBA programs, have been relied upon.

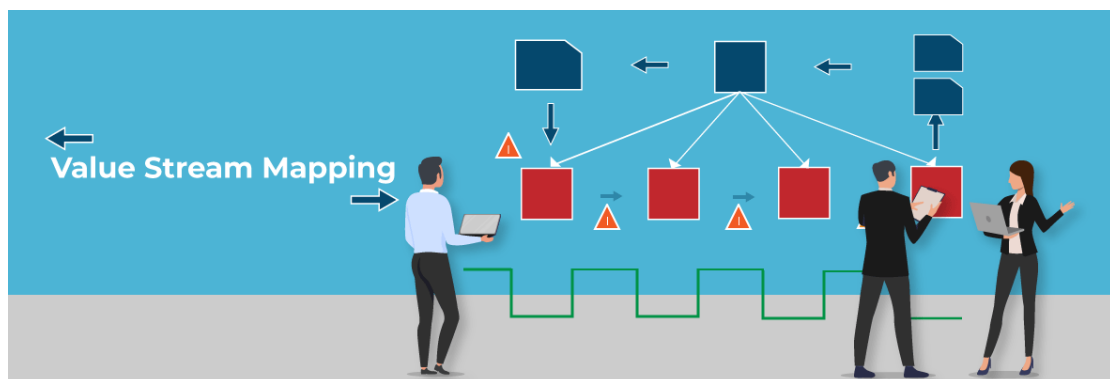


Figure (1) VSM

Methodology outline



1. Identify the project management system in the companies under study



2. Addressing the most important strengths and weaknesses of the system.



3. Addressing system vulnerabilities



4. Recommendations

Definition of methodology

1. Identify the project management system in the companies under study: This is done by presenting the software systems that are used in the companies under study and identifying the nature of their management of projects that fall under the powers of the supervision of the companies under study.

2. Addressing the most important strengths and weaknesses of the system: The Strengths, Weaknesses, Opportunities, and Threats (SWOT) method was originally developed for business and industry but is equally useful in project management.

It should be noted that the SWOT method is not the only estimation technique that can be used, but this method has a long track record of effectiveness.

3. Addressing system: Addressing the weaknesses of the system, after ensuring that the system has been analyzed, identifying the strengths and weaknesses, and working to address the weaknesses as evidenced by the analysis processes.

4.Recommendations: Provide recommendations that would work to strengthen and improve the project management system used in the company under study.

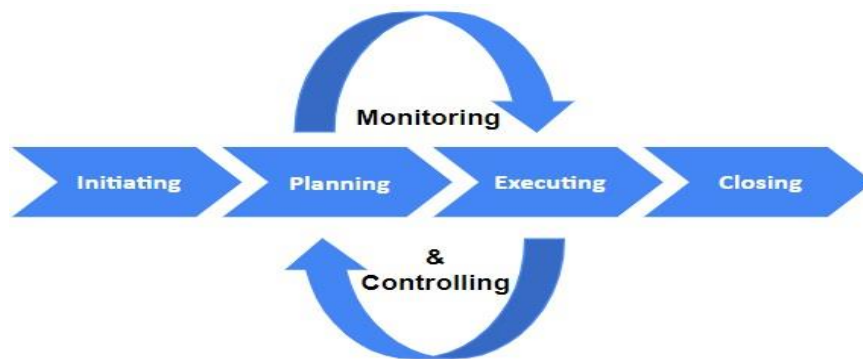


Figure (2)

The limits of the study

Substantive boundaries: Improve the construction project-case study Midrar and PRESCO companies.

Temporal boundaries: third term 2023

Spatial boundaries: Jeddah – KSA

Chapter 4

Analysis and study

Engineering Project Management Operations:

1.Project initiation: Every project is created to achieve a certain goal, even if it is just for fun. And many projects arise for a moment and then die in their infancy. Know that the reason for the death of these projects in their infancy is that they went through the stage of initiating projects.

What makes projects die in their infancy is a simplified feasibility study. If you want to change the arrangement of your office, the simplified feasibility study that you will do is to calibrate that project with the conditions and limitations available to you.

These determinants usually include - but not all - time, time, cost, the scope of the project's impact, and other determinants. Based on these determinants, do I decide to arrange my office?!! If your decision was not to arrange, then perhaps the time did not help you, and if your decision was yes, then move on to the planning stage.

Testing your ability to implement the project and calibrating it on the determinants and conditions and approving and rejecting it was represented by the process of initiating the project. (Mohammad Atiyyah, 2021)

2.Planning: It is not good practice to have a project without a plan, but there is no project without a plan. During the planning process, you can set up rules to develop a detailed plan for what you want to implement. The plan that emerges from the planning process does not mean that you only plan for the implementation, but that you even plan for the plan itself. You plan your plans - me. H. You set the planning criteria - you

also plan how the project will be implemented, how it will be monitored, and how it will be completed. Do not leave vagrants in your project unless you have a plan. You may have something happen that you can only plan for after implementing part of the project. (Mohammad Atiyyah, 2021)

3.Execution: In the implementation phase, the plans that you drew are being implemented on the ground. He believes that the implementation process is one of the most difficult and important stages in the project life cycle. But to correct you, the implementation phase is less important and impactful than the planning process, and the impact of error in it is less than planning errors. Any undetected error in the early stages of projects is very costly to fix. Fixing implementation errors is usually less expensive than fixing planning errors. (Mohammad Atiyyah, 2021)

4.Monitor and control: While execution processes are taking place, monitoring and control processes are taking place in parallel. Its importance comes in evaluating the course of the project and preserving it from deviating from the planned path. It also evaluates the status of the project, even if it proceeds according to the plan, as that plan may lead them to the failure of the project.

Monitoring and control processes require changes in the project implementation processes. Some of these changes that fall within the framework of what was agreed upon do not affect the course of the project work, its objectives, or the time of its delivery. This type of changes is implemented immediately by including it in the implementation processes and handing it over to the work team. . Amendments with changes in the course of project implementation are re-planned with the re-planning of the project itself. After that, we enter it into the implementation stage and the work team begins to implement it, but these amendments may have a strong impact on the project's

baseline, so you will return to the project initiation stage to study whether there is any point in continuing the project, or is it better to end it!! (Mohammad Atiyyah, 2021)

5.Finishing the project: If the project is to build a house, it is wrong to consider the end of the project as the end of the construction process. Many operations must be performed at the end of the project, such as assembling the tools used, cleaning the surroundings of the house, handing over the project and other operations that you can imagine. The completion stage of the project is usually ignored due to ignorance of its importance, but it represents a part that must be mastered to ensure the success of the project, not only this, but also to ensure the success of other projects.

These are the five project management processes, but you may implement them during one-project dozens of times, how is that? Imagine that you have a project large enough for you to consider each phase of project management as an independent project. I realized the situation?!! And the larger the project, the more frequently these processes are followed, with different stages. (Mohammad Atiyyah, 2021)

Recognized project management software

The programs that will be relied upon in the study and analysis processes are Primavera -Value Stream Mapping - Kaizen- JIT and GEMBA.

1- Primavera

Primavera is a program used for project planning.

The program is used to prepare schedules for projects, calculate and control costs, as well as monitor growth in the project, whether by progress or delay. It also calculates the duration of the project and the resources to be used and determines the optimal use

of these resources, in addition to the ability to review any previous project and compare it with the current situation, and know the extent of the delay, whether at the level of time or at the level of resources.

- i. In 1983, the first version of the program was released, which was running under the DOS environment
- ii. In 1994, the P3 version was released, which works under the Windows environment
- iii. In 2008, Oracle Corporation acquired Primavera
- iv. In 2010, Oracle discontinued P3 and continued to support P6 after its development.

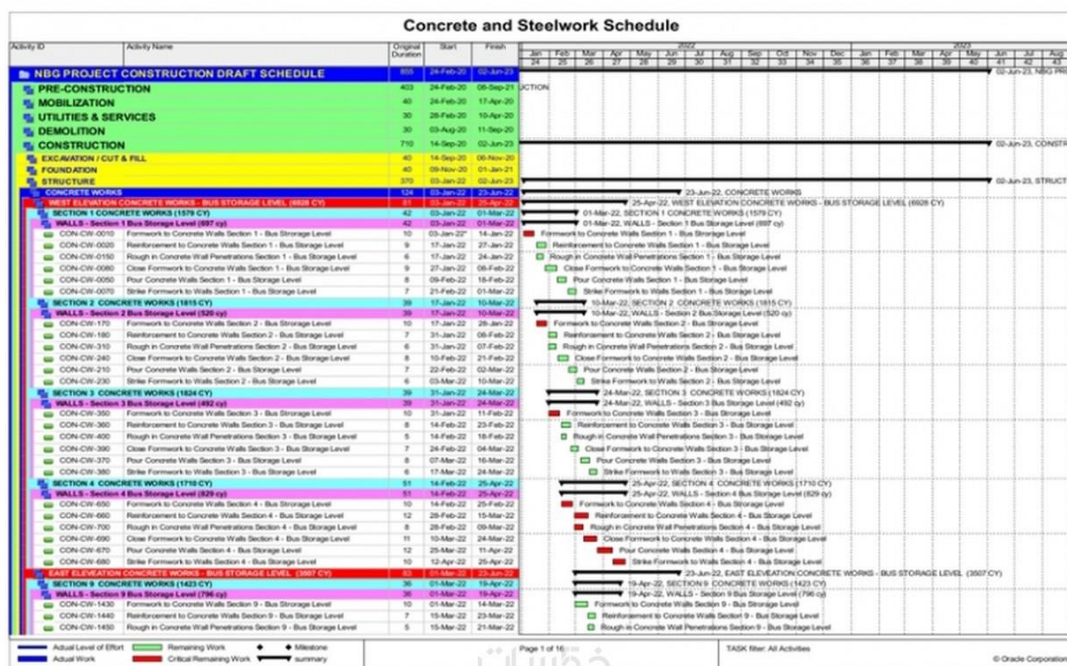


Figure (3) Follow-up material by Primavera

2- Value Stream Mapping

Value stream mapping, also known as material and information flow mapping, is a lean management methodology for analyzing the current state and designing the future state of a product or service as a series of events from the beginning of a specific process until it reaches the customer. Value stream mapping is a visualization tool that shows all the key steps in a given process and easily quantifies the time and amount spent at each stage. A value stream map shows the flow of materials and information throughout the process.

A value stream map depicts the core business processes that add value to a tangible product, while a value chain map shows an overview of all activities within a company. Other business activities can be represented with "value stream maps" and/or other types of diagrams that describe business processes that create and use business data. (Manos, Tony , 2006).

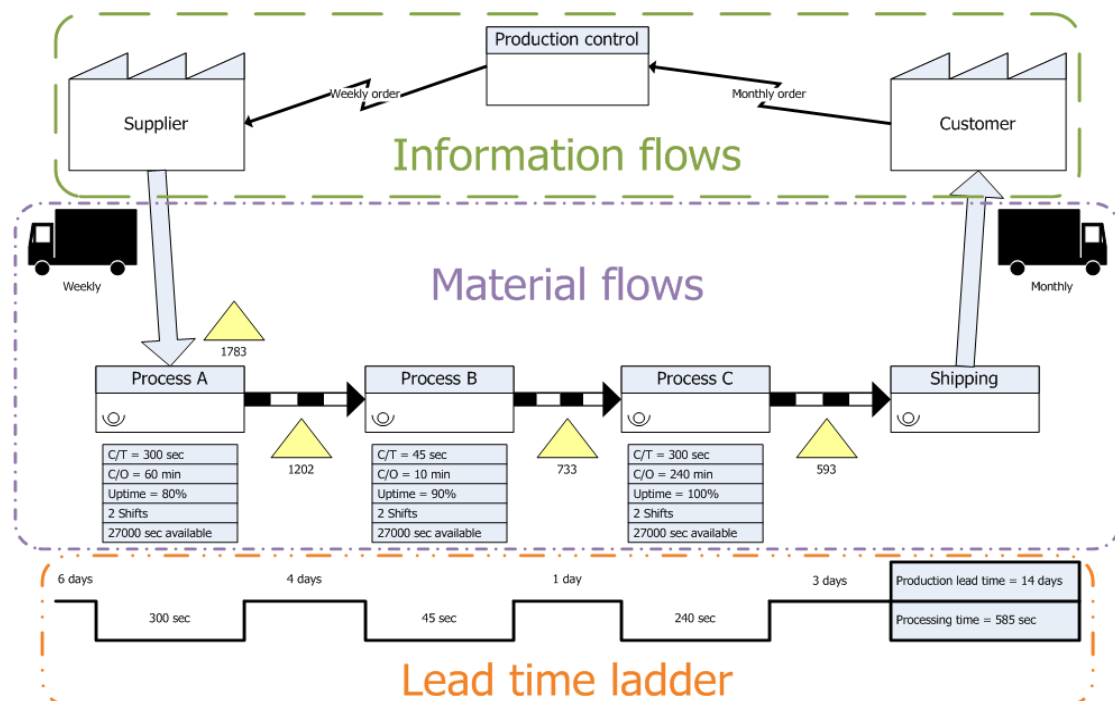


Figure (4) Follow up on materials via value stream map.

3- Kaizen

The word Kaizen translated from Japanese means "to change something for the better."

Kaizen is a philosophy of continuous, systematic, and incremental improvement in the way things are done, aimed at the continuous improvement of production processes in a business.

Continuous improvement strategy:

A continuous improvement strategy aims to have continuous improvement of production processes in a business. It involves eliminating unnecessary waste from processes that add cost without adding value. Although primarily associated with manufacturing, kaizen brings significant value to companies across all functions including healthcare, finance, psychotherapy, and life coaching.

Importance of Kaizen Method:

A successful Kaizen method can be utilized as follows:

- i. Less waste of time, resources and revenue.
- ii. Establishing a Culture of Ownership: Employees have a direct influence on the way things are done, making them happier and more confident.
- iii. Improving competitiveness, whether among employees by providing suggestions or through efficiency that contributes to reducing costs and raising quality.
- iv. Increased consumer satisfaction: Higher quality means happier customers.
- v. Facilitate Problem Solving: Encouraging employees to continually solve problems by looking at processes in a positive light.(Amit, K. A., & Stiraj, C. ,2015).

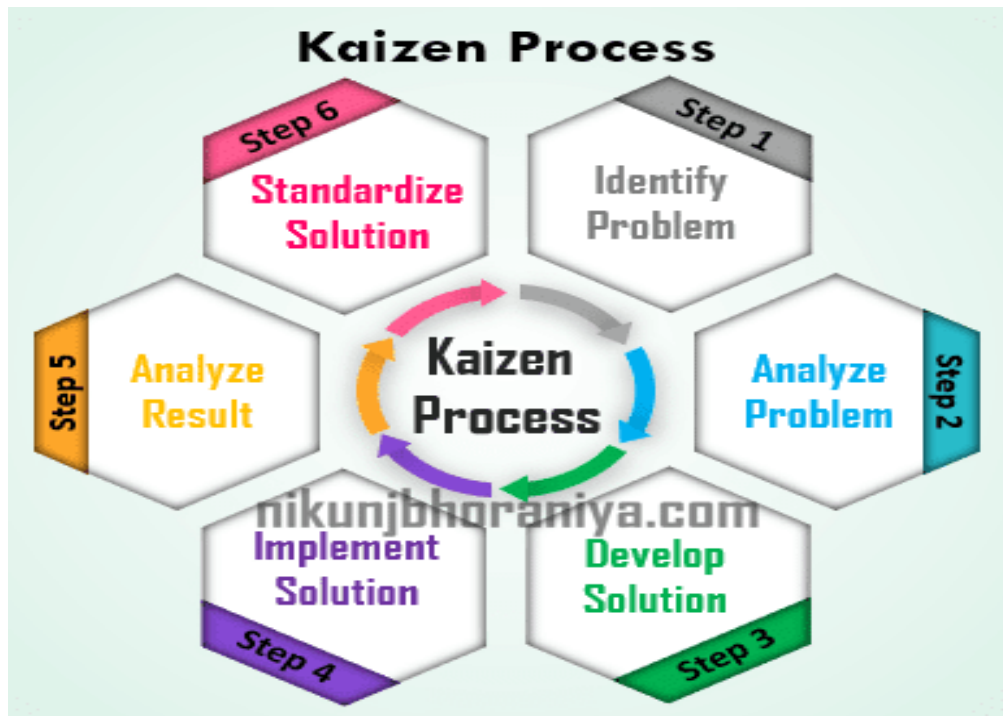


Figure (5) Kaizen process

4-JIT

JIT is the most embodiment of the elements and components of lean systems, as the philosophy of JIT is simple, but it is very effective in achieving the goals of lean systems represented in getting rid of different types of waste, waste, and loss by reducing excess capacity or excess inventory and getting rid of activities that do not add any value, and producing Only parts and products that are needed, and continuous improvement of value-adding activities for operations. Efforts to improve quality, productivity, and operations in JIT systems and agile systems are based on Kaizen - the Japanese term for continuous improvement approach, in eliminating all sources of waste, which will be mentioned in the paragraph 11-5, and the simplification of operational processes, kaizen requires, to lead continuous improvement efforts, the participation of every individual at every administrative level because the basis for the success of streamlining is the desire of workers to detect quality problems, stop

machines or processes when there are quality problems in them, and generate Ideas for improvement, analysis of operations, completion of various functions, and modification of their business paths.

The basic idea of kaizen is that excess capacity or inventory will mask major problems in operations. Therefore, JIT systems and agile systems provided an organized mechanism in a systematic way to detect these problems by reducing the inventory to the extent that leads to the discovery of problems in order to be addressed and the system to work smoothly, then the inventory reduction is repeated, so the problems are revealed and appear again every time, and they are addressed to get rid of Of which . Perhaps in simulating the flow of water over the bottom of the rocks with the stock in the example of water, rocks and the boat is the best illustration of the mechanism of reducing the stock. The water level is similar to the stock level in the system and the rocks represent the problems that are encountered during the production process. When the water level (stock) is too high, it will cover or it hides the rocks (system problems) and at the same time, the boat (the system outputs to meet customer orders) will sail over the rocks smoothly without hitting them. When the stock (water) level is lowered the problems (rocks) become visible, and the system lags or fails to meet its obligations (the boat will hit the rocks if the water level drops too low for them to appear), after the visible rocks are broken up, the boat He can set sail again and so the same situation is repeated whenever capacity is reduced or inventory is reduced. (Mohsen Najjar ,2021)



Figure (6) JIT approach

5-Building Information Modeling:

End-to-end modeling, or Building Information Modeling (BIM), is the process of generating and managing building data throughout its lifecycle. This type of modeling involves designing as objects (opaque and unknown, generic or product specific, solid or spatial shapes (such as the shape of a room)) and those objects bearing geometric properties and their associated relationships and attributes. The design tools in the information modeling system allow extracting different projections of the building for production purposes and other uses. These projections are automatically consistent with each other—meaning that all objects are identical in their different projections in terms of size, shape, and location—because each object is identified only once, as is the case in real life. Automated projection matching eliminates many of the errors that occur from the normal projection method for each projection separately. The process is typically done by dynamic real-time 3D modeling software to increase productivity in the design, construction, and construction industry. This process produces the informational model of the building, which includes spatial relations, geographical

information, quantities, and the characteristics of the building components. Each piece (such as furniture and fixtures) can also contain links to choose and order them directly, or inquire about their prices to know the total costs with the rest of the materials used. This method is considered more efficient and practical than the traditional methods of inquiry and cost control in construction projects, and this removes many obstacles and surprises that arise during the implementation period, since it can be verified during the design stage and avoided so as not to hinder work later. Also, any changes during the real construction process will be made in the informational model of the building and keep it as close to reality as possible and help later in the maintenance and management operations of the building. In addition to controlling each individual object, this modeling process defines object associations. If, for example, a specific object is changed in some way linked to another object, then both objects change according to the relationship between them, and the program may reject this change if it opposes the logical relationships in the model between the objects. (Lee, G., Sacks, R., and Eastman, C. M, 2006).

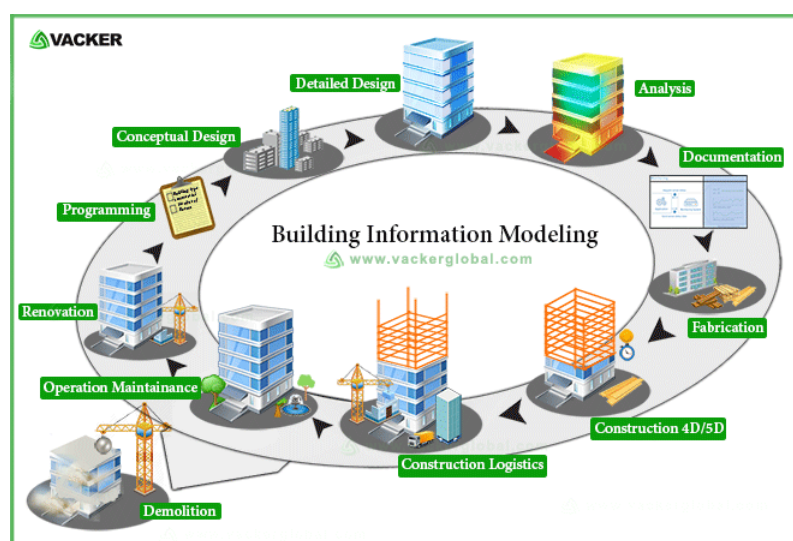


Figure (7) BIM diagram

How do the companies under study follow the project management system?

In this part, we will learn about the project management method in one of the companies under study and how to benefit from the program in stopping waste of materials through the Multi Story Building Project Revise program.

Activity ID	Activity name	Original duration	BL project stat	BL project stat	Start	Finish	Schedule %complete	perfo
Power & Lighting System		214	05-Dec-2023	06-Jul-2024	05-Dec-2023	06-Jul-2024	0%	0%
1st Fix		05-Dec-2023	14-Mar-2024	05-Dec-2023	05-Dec-2023	14-Mar-2024	0%	0%

Through the above table, we notice that all the operations required in the work of the project are subject to a timetable and the name of an activity.

When working on a specific project, many elements need to be managed, including but not limited to:

The general plan of the project. It indicates the project plan, objectives and requirements. It is the link or roadmap between the goals to be achieved and the budget and resources allocated to achieving those goals.

Resources. It includes three aspects: human, financial and equipment resources. Care should be taken to ensure that the resources allocated to the project are sufficient to complete it before the delivery time and with the required quality.

The time. All tasks should be scheduled (some may overlap, others should be completed in a certain time order), with start and delivery times and project progress monitored.

Managing these elements is a complex process, and can be a drain on a manager's time, especially if the project is large and many employees are working on it. Each of them

has its own competencies, responsibilities and tasks that should be implemented in parallel to achieve the ultimate goal of the project.

Project management tools have emerged to help managers manage project components. Its main purpose is to help the work team plan the project, ensure smooth workflow, and track the progress of tasks. Taking into account the resources allocated to the project and in addition, it facilitates and facilitates the management of several projects at the same time, and from within the same system.

Project management system in Midrar Company

An integrated ERP system to manage your business.

The only platform you will ever need to help run your business. Integrated, simple apps loved by millions of users. The company designs and installs systems according to the needs of companies that wish to obtain its services and the number of employees for higher productivity and to meet all the needs of companies in the field of project management.

Project management system in PRESCO Company

PM project management system

The project management system enables institutions and companies to automate the procedures related to the follow-up and implementation of projects and the management and coordination of work more effectively, starting from projects that are executed only once to complex programs, through the entire project life cycle.

The project management system also monitors performance and displays dashboards to facilitate informed decision-making about current projects, new opportunities and budget processes, and assists supervisors in setting standards for their operations that would ensure a high project success rate.

Its advantages:

- i. Divide the project into several phases and identify the required tasks in all phases.
- ii. Completion of the project with the required quality, at the estimated time and at the specified cost.

- iii. Divide the project and match it with what is planned to know the deviations and treat them.
- iv. Managing extracts and processing them in accordance with the contracts concluded.
- v. The additional works.
- vi. Completion rate.

By using the project management software, you will be able to:

- a. Project registration
- b. Restricting service projects and linking tasks and project materials to them.
- c. Record the number of working hours and who is responsible for completing tasks.
- d. List tasks and actions
- e. Assigned tasks will appear in each employee's task book.
- f. Knowing the dates of their achievement of completing the tasks assigned to them.
- g. Linking: linking the task with documents of other programs such as accounting and personnel affairs program.
- h. Upload documents and attachments with any task completed.
- i. Ease of attribution
- j. You can assign tasks to your employees and vice versa, your employees can assign a task to you or another employee.
- k. The possibility of transferring the task between more than one employee with complete flexibility without losing its history.

Chapter 5

Results, recommendations, and conclusion

Results

1. The study concluded that in order for the projects to proceed as planned, project management programs must be relied upon.
2. Project management software maintains the progress of work in the project and contributes to reducing the process of wasting materials related to the project.
3. On megaprojects, various contingent variables can create great difficulty in keeping the project progress plan in line with the initial plans. However, careful monitoring, analysis and regular can keep this under control.
4. In the implementation phase, the plans that you drew are being implemented on the ground. He believes that the implementation process is one of the most difficult and important stages in the project life cycle.
5. There is a group of project management programs that have been identified through this research, and some of them can be referred to in the following points:
6. Building Information Modeling (BIM) is the process of designing and managing construction projects using a digital model of an integrated set of project-related information.
7. JIT is the most embodiment of the elements and components of lean systems, as the philosophy of JIT is simple, but it is very effective in achieving the goals of lean systems represented in getting rid of different types of waste.
8. The word Kaizen translated from Japanese means "to change something for the better." Kaizen is a philosophy of continuous, systematic, and incremental

improvement in the way things are done, aimed at the continuous improvement of production processes in a business.

9. The companies that were studied apply the project management system according to different types, and all of them were found working to reduce the cost in waste to a minimum and take advantage of the time to complete the project.

Recommendations

1. Optimal utilization of material and human resources within a work plan that ensures the realization of concepts of quality and improvement in construction projects.
2. Involving the public and private sectors in developing a strategic plan aimed at applying quality standards and improvement in construction projects.
3. The senior management of the institutions must commit to achieving the improvement of construction projects to be a role model for the rest of the employees.

Conclusion

In this research, we talked about some of the basic elements of project management programs, as we were exposed to some programs and companies that use these programs, and we attached them to the examples shown for that. We hope that community organizations will start using these tools and techniques, and these tools will not bear fruit unless they are used regularly and continuously. Eventually it will become very easy for her to use these tools. We hope that the service provided by companies working in the field of project management will improve after using these project management techniques and that many companies will be able to obtain and maintain more resources.

Through the above research and study, we found out that any of the companies that have been studied apply the project management system of all kinds, and all of them work to reduce the cost of waste to a minimum and take advantage of the time to complete the project.

In conclusion, we can only extend our sincere thanks and appreciation to everyone who facilitated my research mission, especially the supervising dr. Fayez Ali and Dr. Alfaisal abdelhameed who supervised this work.

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Appendices

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