



**EUROPEAN
INTERNATIONAL
UNIVERSITY**



COVER PAGE AND DECLARATION

	Master of Business Administration (M.B.A.)
Specialisation:	Operation Management
Affiliated Center:	Ahmed Samy Abdelrahman Abdelhamid
Module Code & Module Title:	MGT590- Action Research Paper
Student's Full Name:	Ahmed Samy Abdelrahman Abdelhamid
Student ID:	EIU2020572
Word Count:	7056
Date of Submission:	29, August 2023

I confirm that this assignment is my own work, is not copied from any other person's work (published/unpublished), and has not been previously submitted for assessment elsewhere.

E-SIGNATURE:

DATE:

29, August 2023

EIU Paris City Campus

Address: 59 Rue Lamarck, 75018 Paris, France | **Tel:** +33 144 857 317 | **Mobile/WhatsApp:** +33607591197 | **Email:** paris@eiu.ac

EIU Corporate Strategy & Operations Headquarter

Address: 12th Fl. Amarin Tower, 496-502 Ploenchit Rd., Bangkok 10330, Thailand | **Tel:** +66(2)256923 & +66(2)2569908 | **Mobile/WhatsApp:** +33607591197 | **Email:** info@eiu.ac

Table of Contents

Contents

Table of Contents.....	2
1.Action Research Topic.....	5
2.Abstract.....	5
3.Introduction	7
3.1 Background.....	7
4.Research Aim and Objectives.....	10
4.1 Research Questions.....	10
5.Literature Review	11
5.1 Methods of Measurement of Labors Productivity	11
5.1.1. Notes for this productivity measurement way	13
5.2 FACTORS AFFECTING PRODUCTIVITY	13
5.2.1 Labors Skills & Condition	13
5.2.2 Material Available	14
5.2.3 Motivation Group.....	15
5.2.4 Lack of Measurement of Productivity	15
5.2.4.1 My Notes for Lack of Measurement.....	16
5.2.5 Leadership Group.....	16
5.2.5.1 Notes Leadership group	16
5.2.6 Supervision	16
5.2.7 Management.....	17
5.3 How to Improve construction labors productivity	18

5.3.1 Analysis of the causes of low productivity	18
5.3.2 Team work Communication	18
5.3.3 Realistic Project Plan	19
5.3.4 Reward Regularly	19
5.3.5 Training.....	19
5.3.6 Good planning.....	19
5.3.7 Hiring Real Leader to Manage Site	20
5.3.8 Available Materials	20
5.2.9 Manage labors Overtime.....	20
6 Methodology.....	21
6.1 Participants of the study.....	21
6.1.1 primary data resource.....	21
6.1.2 Second Data Resource	22
6.2 Considerations for Data Collection.....	23
6.3 Activity Sampling	24
6.4 PROCESS ANALYSIS	25
6.5 LINK ANALYSIS	25
6.6 STATISTICAL METHODS.....	26
6.7 Survey Organization	26
6.8 Questionnaire methods.....	26
6.9 Questionnaire Distributions	27
6.10 the sample size	27
7 Results and analysis.....	29
7.1 Data Analysis and Findings.....	29

7.1.1 Steps for Data analysis.....	29
7.1.2 analysis for experience years of Survey Participants.....	30
7.1.3 Business type for Survey Participants.....	31
7.1.4 Total Staff Member Company for Survey Participants	31
7.1.5 which high productivity nationality & quality in KSA Market	32
7.1.6 Measurement of labors productivity in Participants company	32
7.1.7 The factors affecting in labor productivity in construction field	33
7.1.8 the percentage of motivation system in survey Participants company	34
7.1.9 Labors productivity improvement methods	35
7.1.10 Construction Labor loyalty percentage.....	35
7.1.11 If create new motivation system will help to increase labor productivity (yes or NO) ...	36
7.1.12 How to improve the labors productivity	37
7.1.13 Methods of raise team work (labors) loyalty	37
8. Conclusion.....	39
9. References	41
Bibliography	41
10. Appendix	44

1. Action Research Topic

“The study of labor productivity problems in Saudi construction companies starting by measurement of daily productivity to Determine productivity rate, study of the effecting factors in construction labor productivity, and how to improve labor productivity.”

2. Abstract

This research aims to study how to raise labor productivity in Saudi contracting companies by identifying and analyzing the factors that affect labor productivity in the Kingdom of Saudi Arabia by using a selection of surveys for the 5 largest construction companies in the Kingdom of Saudi Arabia, one of which is AECC, as well as X., ACC, Al Seif Engineering Contracting Company, RTCC, and Beijing Emirates International Construction Company, all of which also used several research papers on the issue and surveyed their members.

This practical research is divided into three main sections:

Methods for measuring labor productivity are the primary step in any research on the productivity of construction workers, and no operating manager can improve the productivity of his workers without measuring the actual productivity of each construction activity in different months, levels, locations, and weather conditions.

The second section deals with factors affecting construction labor productivity. A study was conducted through multiple research studies and research surveys of construction labor by supervisors, engineers, operations managers, and project managers to identify the most influential factors in the productivity of construction labor in the Gulf countries. This study depends on the causes of labor skills, including external causes, administrative reasons, and psychological reasons. And in the third section, a study of how to improve labor productivity to help contracting companies avoid losses and provide competitive prices in the field of construction. Improve labor's productivity by increasing communication between all team members, from labor to the project

manager, creating a reward system (a bonus system) based on labor's productivity rate in every activity, Implementation of a training plan for low-skilled labors, review every week for project plan to modified it as per actual status, and The challenges of improving the productivity of labor in construction often require hiring a real leader who can lead the work team and help them raise their productivity.

3. Introduction

Construction is an industry largely driven by private investors and the government, with government contracting increasing in 2022 to reach 100 billion dollars and the private residential contracting market reaching 45 billion dollars after suffering a lot in 2020 due to the Corona pandemic. There is also a great trend from the Saudi government to increase the numbers of units for citizens at various levels to cover all citizens requirements.

All of the above create an attractive contracting market in which many contracting companies need to participate from foreign countries, and the emergence of a large number of local new contracting companies showed fierce competition in this field, including prices. So, all companies now search for strong operation management to pursue this challenge in terms of time, quality, costs, and reducing waste. It is susceptible to numerous technical and business risks, which are often greater than traditional risks.

3.1 Background

Regarding the construction field risks, there are sixty (60) major risks captured in this field and ranked within the category as well as the overall ranks of the risks.

the top ranked in technical risk, financial risk, unsafe incidents and accidents risks, logistic accidents during transit lifting, procurement risk, legal risk (breach of contract), security risk (theft of materials 1), the big waste of site materials, poverty of managers and lobbyists experiences, bad action planning, tendering risk, and low site labor productivity.

Regarding the study of PHD. Nagarajan MuthuKrishnan in construction field risks, the most important influencing factors will be reviewed and the percentage of their impact on the quality of operating management will be determined. Procurement risk (27%), Other Risk (21%), Legal Risk (20%) are the most highly rated risks, followed by technical risk (17%) and Financial Risk (15%).

The level of risk in operation management is high at the middle management level, including a

low level at the worker level (62%), and average at the top management level (28%). (Muthukrishnan & Ganapathi, 2001)

The success of any operation management department depends on its success in avoiding all risks, which have high impacts on project performance in quality (60%), timeline (43%), and delivery (49%), and a medium impact on cost (45%) in the construction project.

Operation management in the field of construction relies on several factors to succeed in its tasks, including the delivery of activities on time without extra costs, which include labor costs that represent up to 30% to 50% of the total cost depending on project type and the required quality. The most important of these factors is predicting risks and trying to avoid them in the planning stage.

So, construction labor productivity and cost play a critical role in most of the construction projects, so efforts to improve labor productivity levels should be considered, and more effective operation management is the main role to increase labor productivity, which will help operating management to reduce costs and achieve a lower target cost.

Labor in contracting projects and improving productivity is a major concern for any profit-oriented organization, as operation management faces a major challenge in converting effective and resource-efficient productivity into marketable products and deliverables to clients.

Despite the existence of a large number of studies related to labor productivity, resource management, and overcoming the risks of construction projects, there is no agreement on a standard system for measuring labor productivity in construction sites because it is difficult to obtain a standard method for measuring labor productivity due to the complexity of the project and the unique characteristics of construction projects and conditions, the work environment, the availability of raw materials, and the speed of response of technical offices to cover operating management plans.

There is a general consensus among project and operation managers to define productivity as the ratio of output to input; thus, labor productivity can be seen as a measure of the output obtained through a set of inputs. Another factor is particular factor productivity, where output and a single selected input are considered.

The advantages of partial factor productivity are manifold; by focusing on a selected factor, the measurement process becomes easier and more controllable. As a result, more reliable and accurate data can be obtained.

4.Research Aim and Objectives

The success of operation management in any construction company depends on factors such as cost, time overruns, quality, and health and safety, which are historically poor in the construction fields. Although there are many global safety standards that help to decrease these hazards, the experience of how to close out projects The COVID-19 pandemic led to significant losses in the contracting company sector over the years 2020 and 2021, and this study deals with the need to raise the efficiency and productivity of workers in the contracting sector to compensate for the losses of companies during the Corona epidemic and also to keep pace with the competition of contracting companies in reducing prices to obtain competitions and tenders to employ their workers. Away from profit or loss accounts, therefore, this study is exposed to several aspects, including the operating management for the work team at the sites of labor, supervisors, and engineers, which represent nearly 50% of almost all contracting activities, and the administrative and technical side in terms of providing materials and calculating their quantities and how to reduce waste with them, which material waste is An element neglected by site managers, and contracting companies discover it at the end of the project, which causes unnecessary losses, especially if the materials are not applicable for use in other projects or are damaged, to increase profits, compensate for the losses of the previous two years, and compete with the current companies in their prices that reach their cost.

4.1 Research Questions

This research has addressed five research questions that are answered further. The research questions are:

1. How do you measure the construction labor's productivity for every activity?
2. What are the factors affecting construction labor's productivity?
3. How to improve construction labor productivity to reduce activity costs?

4. What are the operations management roles to improve construction labor's productivity?
5. How to raise the laborer's loyalty to the company?

4. Literature Review

The productivity of the workers for any activity or item in the contract is what determines the price of the item by 50%. Any failure to achieve the required quantities leads to an increase in the cost of the item, which affects profitability and may reach a loss. Therefore, studying the productivity of labor and how to increase it is a very important axis that affects the continuity of contracting companies in the market, so two studies on the same topic were selected for study in this research, which are as follows:

- Labor productivity in the construction industry is a factor influencing Spanish construction labor productivity.
- Review on productivity improvement in the construction industry. (Ibbs, 2005)

Construction industry productivity is mostly influenced by three variables: labor force makeup, organizational structures, and outside problems. Researchers have identified a variety of variables that affect construction productivity. (J & N, 2017)

The construction industry is the biggest and most difficult industry in the world. In the construction business, human resources play a key role in boosting production. Productivity can increase through the best possible use of human resources. (Liberda, Ruwanpura, & Jergeas,, 2012)

5.1 Methods of Measurement of Labors Productivity

It is not possible to improve the productivity of construction labor without measuring the productivity of the individual in each current activity and comparing it with the productivity to be achieved. There are activities that measure productivity on a team consisting of two teachers

and an assistant with us in order to be more accurate in measuring productivity.

Therefore, some method of measurement was chosen based on the research of those interested in this subject.

A construction project is deemed successful if it is finished within budget and according to schedule.

Productivity must be effective for: Strategic and operational planning heavily relies on productivity projections.

For many complex scenarios, quantitative forecasting is used in the decision-making process, so site productivity is one of the most challenging factors to evaluate because it depends greatly on the size of the site and the location of the measurement.

(Grau, Caldas, Haas, Goodrum, & Gong, 2009) (Murodif, Erizal, & Widyarti, 2016)

We can use the following formula to calculate labor's productivity (an easy, fast way).

Labour Productivity Formula

Labour productivity is calculated using this formula:

Output per period (units)

Number of employees at work

(<https://www.tutor2u.net/business/reference/labour-productivity>, 22 Mar 2021)

5.1.1. Notes for this productivity measurement way

- In this method, temperatures and time of year were neglected during the measurement of labor's productivity, which may lead to an imbalance in achieving planning targets based on the productivity scale.
- No supervision (engineers, supervisors, and Forman's) at the site was mentioned during the measurement, nor was the effect of their presence and numbers on the productivity of labor.
- The laborers were not asked about the behavior of their direct managers, the site manager, or their satisfaction with the company's policy.
- Some measures that affect productivity were not mentioned, such as working under the sun, inside buildings, underground, or in a high-rise city. These items will affect labor's productivity.

5.2 FACTORS AFFECTING PRODUCTIVITY

To increase productivity, we need to limit and study the factors that affect it, both positive and negative. Using factors that positively affect productivity and eliminating (or controlling) factors that negatively affect productivity ultimately increases productivity. Productivity can also be predicted if all the factors that affect productivity are known, with the main factors affecting construction productivity as follows items. (Enshassi, Al-Halaq, & Abu Mustafa, 2007)

5.2.1 Labors Skills & Condition

The results show that the most important factor negatively affecting productivity is a lack of labor experience, followed by labor disloyalty, labor dissatisfaction, misunderstanding among labor, a lack of competition, an increase in laborer age, labor absenteeism, and labor personal problems.

1	Lack of labors experience	lack of manpower experience has a significant impact on productivity, also more cost for fix this work.
2	Labors disloyalty	The most important reasons for the worker's lack of responsibility <u>is</u> the lack of loyalty to a company, where the worker turns from a product into a burden on the company and a source of negative energy in the site
3	Labors dissatisfaction	As a result of several reasons, including his sense of unfairness, bargaining and lack of respect, or that he does not obtain his rights, or that the upper management of the company deals with him unprofessionally.
4	Misunderstanding among labors	The lack of understanding of the work team leads to a lack of productivity and lack of cooperation in raising the level of productivity and making the main focus of the team how to win in the differences between them
5	Lack of competition	The presence of a number of professional team members, their good management, and the creation of a spirit of competition among them helps to extract all energies from the work team members
6	Increase of laborers age	It reduces the activity of the worker and the speed of his movement, which leads to a decrease in production
7	Labor absenteeism	The biggest problem facing the contracting companies is because the worker feels that he has the money needed to live for a week longer, and he is too lazy to come to work.
8	Labor personal problems	The task of the supervisor on each team is to listen to the workers' personal problems and treat what can be treated

(Enshassi, Al-Halaq, & Abu Mustafa, LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS, 2017)

5.2.2 Material Available

Research is ongoing that demonstrates the implications of poor material management on construction site productivity.

examined how atomization in component identification and localization affected productivity. They kept track of the time it took for the identical process and the conventional site material tracking process. (V. J & M. N., 2017)

5.2.2.1 notes for lack in material

The delay in materials arriving at the site is not only a transportation problem, but there are many reasons, as follows: this affects productivity rate, and high items cost unnecessarily due to workers' wages.

5.2.3 Motivation Group

Lack of employee motivation leads employees to engage in anti-work behavior, which leads to apathy, late delivery, and workplace dissatisfaction, which affects employee productivity. There are six factors related to group motivation; these factors are listed in order of importance:

	Factors	Note
1	Payment delay	Late payments can have a very negative effect on employee morale and will sure reduce productivity.
2	Lack of financial motivation system	Employers believed that the lack of financial incentive systems had a greater negative effect on labor productivity than the lack of job recognition programs.
3	Lack of labor recognition programs	Work motivation is very important because it ensures the satisfaction of field workers such as sense of achievement responsibility and job satisfaction.
4	Non-provision of transport means	Lack of transportation is not considered as helpful as other factors for work productivity and places to eat and relax.
5	Lack of places for eating and relaxation	sure, benefits such as transportation food and uniforms have a greater impact on job productivity
6	Lack of training sessions	Contractors surveyed indicated that they needed training sessions and worked closely with skilled operators to train their employees more effectively on site.

(Enshassi, Al-Halaq, & Abu Mustafa, LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS, 2007)

5.2.4 Lack of Measurement of Productivity

There are many labor factors that affect a construction project. To improve labor productivity, field activity should be measured and recorded regularly and always compared with acceptable standard parameters. This provides an accurate baseline productivity of previous

projects under the same conditions. Creative operating managers use records to solve labor problems and improve productivity. (Sweis, Sweis, Abu Hammad, & Abu Rumman, 2009)

5.2.4.1 My Notes for Lack of Measurement

My belief from my experience as an operation manager is that measuring, recording, and reviewing the productivity of the work team at construction sites daily and weekly It does not help in future projects by determining the average productivity only, but it can be used to know the problems facing the work team and affecting productivity by monitoring the amount of daily productivity and solving problems quickly before they aggravate and affect the total cost. And it is discovered after realizing losses.

5.2.5 Leadership Group

One is the lack of labor supervision; misunderstanding between workers and supervisors is another factor; and third, the lack of regular meetings with workers. The lack of labor supervision has a major impact on labor productivity. This conclusion is justified because a lack of labor supervision increases labor errors at work and delays corrective action on these errors. Misunderstandings between workers and supervisors have a major impact on worker productivity; they do not have a good relationship. This misunderstanding can negatively affect worker morale and reduce productivity. (Enshassi, Al-Halaq, & Abu Mustafa, LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS, 2007)

5.2.5.1 Notes Leadership group

The meeting of each team leader with them daily during breakfast and lunch and discussing all problems creates team spirit and the workers' sense that all their opinions, suggestions, and complaints are heard.

5.2.6 Supervision

All monitoring factors have a significant impact on productivity and are categorized by

importance as follows: Changes in drawings and specifications during execution. Dynamic drawing and specification changes are the most important of the regulatory factors and one of the top 10 factors that negatively impact productivity. (Thomas, 2023)

5.2.6.1 Notes for Supervision

Supervision should be related to quality with strict control as following:

- The Document controller enters separate daily information into our server systems about each activity including: Number of skilled and unskilled workers or subcontractors employed Location of the activity and number of company labors engaged in it.
- After uploading files by e-mail between 15:00 and 17:00 transfer the files to superiors and Forman's in each specialized field to confirm quality, quantity and the number of labors.
- After determining the daily quantities and the number of manpower, transfer the issue to site engineer for confirmation of approved productivity, quality and item costs, to start the high monitoring & control stage and compare between site cost & item budget.
- After site engineer approved for Quantity & quality and cost, all data will transfer for site manager approval, he should inspect all this quality of this activity & quantity and discuss with site engineer, after site manager approval, system will automatic calculate all total approved quantity for every item or activity (previous until today) and cost and total cost of delivered material. (Tammy, Medani, Ramli, Yunus, & Mohd Noor, 2020)

5.2.7 Management

Decision-making on site is as important as actual construction, and good decision-making is essential to increasing productivity. Recruit site managers with experience and leadership, empower them to become site decision-makers, and improve construction productivity. A contact person is a person who identifies problems in their area. (Abbasnejad, 2013)

Many of the factors affecting productivity are related to operating management, most of which

are related to a lack of detailed planning, such as inadequate decision-making, supply interruptions, and poor supervision due to continuous work and too many shifts.

A key component of this is the development of a practical guide to best practices for improving site productivity, which identifies the different factors that cause productivity loss. (Ibbs & Sun, Use of Mechanical Contractors Association of America Method in Loss of Productivity Claims, 2016)

5.3 How to Improve construction labors productivity

Improving productivity at work can be challenging regardless of your industry. In the construction industry, it is important to ensure precise operation. However, clients generally want their buildings and projects to be completed as quickly as possible. (Patel, Rawal, Shaikh, & Onkar, 2020)

5.3.1 Analysis of the causes of low productivity

The operating manager should first Analysis of the causes of low productivity according to the previously explained factors shows that most of the time, employees work extremely hard, and external factors can affect productivity. Consider the time it will take for machinery or equipment to arrive if workers have not arrived on site, or wait for the right people to fix equipment failures. View non-productive time and perform activity analysis, enabling site managers and operations managers to understand the causes of inefficiencies in production and take action to eliminate them.(AKOMAH, LAWSON, & JACKSON, 2020)

5.3.2 Team work Communication

Communication is the most important driver of productivity in any construction work. No one gets a good job if they don't know what's going on. Before starting a new project or activity, the manager should communicate the target to his employees, update it during the project, and share and update the project plan for better results. Turning them into responsible partners (it is

human behavior) also means the manager should send emails and frequent reminders when changes occur that may affect his employees. Don't leave the employees in the dark about what's going on in a project.

5.3.3 Realistic Project Plan

Building takes time so officials need to develop realistic plans and goals so the entire team knows what to expect each day week month and even year, Project team should have a goal to work towards each day, it seems easier to set small goals to achieve big ones. Furthermore, managers must ensure that all team members understand the project plan. (Thiyagu, Dheenadhayalan, & Janagan, 2016)

5.3.4 Reward Regularly

Construction is often hot and tiring work, so workers are putting in hour after hour of manual labor. To increase productivity, offer incentives in the form of rewards whenever your crew meets a goal. Treat them to dinner during concrete pouring and Pepsi during hot weather days. This will make workers feel appreciated and eager to push forward.

5.3.5 Training

The key to rapid productivity loss is that laborers do not have enough training; it often costs extra money, but it's worth it. Training also reduces the number of workplace injuries, resulting in increased productivity.

So, every active operating manager must know the weaknesses and strengths of the skills of the team he manages and plan training sessions to raise the level of his team's skills, which reduces costs and time at work.

5.3.6 Good planning

Before starting a construction project, a construction manager must develop a detailed plan for completing the work. This includes work planning (resources, time, and quantity)

required materials (including estimated delivery dates), and a host of other logistics (e.g., tooling). The plan also needs to be updated weekly so that it can be modified in many ways to meet the cost and time requirements for the same scope.

5.3.7 Hiring Real Leader to Manage Site

Hiring a good real leader to manage the construction site is one of the most important ways to increase productivity on the site. If they have highly respected but firm leaders in their leadership, the same will be answered. They help managers keep employees focused and working toward company goals. Managers also act as intermediaries between construction workers and upper management to mediate problems (it builds trust between leaders and team workers), which helps increase labor productivity. (Ghoddousi, Alizadeh, Hosseini, & Chileshe, 2014)

5.3.8 Available Materials

There is nothing worse than thinking you have enough building materials to complete a project at the last minute. Site managers with project planners should always check at least one week's inventory of finished goods to avoid this. Check the amount used twice a day or weekly with each progressive productivity revision in the amount of work and the amount of material in the store, and also control the material quantity used in every activity to also decrease material waste.

5.2.9 Manage labors Overtime

At first, you think that offering more overtime will increase productivity and get work done faster., This can work in some cases, although it can cause crashes and errors that cause delays, Employees may become tired from working long hours, which will reduce their productivity, Effective work order management means overtime hours can be reduced, thereby reducing the risk of burnout.

But from my experience in site management, I think a bonus system related to approved

productivity is a better way to help the company and team work, since labor will increase his income depending on his efforts and productivity, and the team worker will expel the non-working and useless elements from them.

6 Methodology

6.1 Participants of the study

Data collection is the process of collecting data with the aim of gaining perceptivity regarding the exploration content. (Taherdoost, 2021)

Using Floyd J. Fowler Survey Research Methods, different data are collected by asking people questions. (Fowler, 1993, p. 156)

This study used a mixed-methods approach, combining qualitative and quantitative research data, techniques, and methods within a single research framework. Mixed methods encompass a multi-faceted approach that combines the advantages of using a single research method to take advantage of the advantages and reduce the disadvantages. Using this approach to gather and evaluate data may assist in increasing the validity and reliability of the research.

Mixed methods can help highlight complex research questions, such as health inequalities, and can also be transformative in addressing the problems of disadvantaged or marginalized populations. Research involving community engagement.

6.1.1 primary data resource

The primary data collection methods most commonly used in this study fall into three broad categories:

- In-depth interviews with supervisors, engineers, construction managers, and project managers.
- Observation methods are used daily for laborers in my construction company.
- Remote survey by e-mail, phone, or WhatsApp for Forman's and engineers in sites in Saudi

Ministry of Interior training cities projects (area for every city is 4 SQ KM) in four different cities in Saudi Arabia (Arrear, Qassim, Jeddah, and Riyadh).

Importance of primary data: It is necessary to obtain information from original sources and process raw data. (Kabir, 2016)

6.1.2 Second Data Resource

Secondary data from a source that has been published in some form is called secondary data. In any study, a literature review is based on secondary data that was collected by someone else for some other purpose.

Common sources of secondary data in any scientific discipline include census data, organizational records, and data collected through qualitative methodology and qualitative research.

Secondary data is essential because it is impossible to conduct a new survey that would adequately capture past changes and developments.

The following are some ways of collecting secondary data for this research:

- Viewing and collecting information from more than 15 research studies on the productivity of workers in the field of construction and the factors most likely to affect it positively or negatively.
- Using the record sheets of my company to determine the productivity of labor in each activity, reviewing the tendering price for projects, and knowing which items are considered a loss due to labor productivity
- Subcontractor invoices from my company (financial statements) and compare them with site inspections and the approved quantity of activities.

In this Action Research, studies and research in regions of the Gulf and similar places have been scrutinized in terms of environment, living conditions, and labor nationalities.

6.2 Considerations for Data Collection

The research is based on fundamentals that cannot be skipped, such as: ethical standards promote the values that are essential to collaborative work, such as trust, accountability, mutual respect, and fairness. For example, many ethical norms in research include guidelines for authorship, copyright and patenting policies, and data sharing policies.

Objectivity is very important, and we strive to avoid bias in research where objectivity is required, including experimental design, data analysis, data interpretation, peer review, personnel decisions, grant applications, and expert testimony. We also try to avoid or minimize bias and self-deception that may affect the research and disclose any personal or financial interests that may influence the research.

Non-Discrimination: Avoid discrimination against participants in the surveys on the basis of sex, race, ethnicity, or other factors that are not related to their scientific competence and integrity.

Integrity as Keep promises and agreements, act in good faith, and strive for consistency in thought and action. We will investigate carefully and critically, using our best effort to fill the void in advertising and outreach missions. We will keep good records of our survey activities, including data collection, survey design, and interactions with potential survey candidates.

Francis Galton (1822–1911), who devised the questionnaire, is credited with this. In comparison to certain other survey forms, questionnaires are more advantageous because they are less expensive, do not require as much effort from the respondent as verbal or telephone surveys, and frequently include standardized answers that make it easy to gather data.

Question types in the survey will consist of a number of questions that the respondent has to answer in a set format, Questions are closed-ended (ordinal-polytomous, where the respondent has more than two ordered options).

It is also considered that once data has been quantified, it can be used to compare and contrast

other research and may be used to measure change.

Our survey found that face-to-face interviews (which were informal, conversational interviews) have several advantages over self-administered questionnaires (selected to be structured interviews), including the ability to ask detailed questions, the ability to probe further to elicit rich data, the lack of literacy requirements for participants, the ability to collect nonverbal data through observation, the ability to explore complex and unresolved issues, and response rates that are typically higher.

We evaluate people in natural environments or naturally occurring circumstances using all of our senses. Long-term immersion in a setting or social scenario; explicitly stated, self-aware notations of how observing is done; imparting attention in ways that are somewhat "standardized"; and recording one's observations are all components of field observation. (Fincham, 2013)

Quantitative data can be used to create new theories and/or test existing hypotheses. Basic guidelines for this research Questionnaire Item Design: The fundamental guidelines are Use phrases that are understood the same way by individuals belonging to the same work field (construction).

A study was conducted to determine whether there were any significant gaps in our research and whether the questions could actually be answered.

6.3 Activity Sampling

The activity sampling approach is used to collect activity samples from the survey that will be used, which are then analyzed using statistical tolerance processes.

Using typical work measurement approaches, founded on statistical work by Tippett, certain types of work may be challenging to research. Large numbers of items are inspected to provide an expected confidence level of fault expectation in this technique, which is very similar to statistical quality control. It goes without saying that the quantity of observations will affect how accurate

activity sampling is. Low precision will be provided by a few rare observations, whereas high accuracy but a higher cost will be provided by many frequent observations.

Therefore, it is crucial that the observer be aware of the ideal number of observations required for a certain study.

This number can be calculated quite simply once an approximate picture of the situation is established using the following formula:

$$N = \frac{4P(100-P)}{L^2}$$

N = Number of observations; P = Approximate occurrence of factor as a percentage of N; L = Acceptable accuracy in occurrence of factor being studied.

6.4 PROCESS ANALYSIS

A detailed explanation of a process' phases that includes the inputs, outputs, and actions that happen in each stage. A process analysis can be used to find possible targets for process improvement by removing waste and raising efficiency, as well as to better understand how the process functions.

Analyzing a process in order to comprehend its activities, how they relate to one another, and the values of pertinent metrics is the first stage in process improvement. The following tasks are typically involved in process analysis:

6.5 LINK ANALYSIS

In order to assess whether the search engine can really find and index the website, this information can be crucial for search engine optimization. Link analysis in networking may involve evaluating the data that travels via physical or virtual links to ascertain the reliability of the connection between each network node, Link analysis has three primary purposes:

- Find matches for known patterns of interest between linked objects.
- Find anomalies by detecting violations of known patterns.
- Find new patterns of interest.

6.6 STATISTICAL METHODS

The collection, summary, analysis, and interpretation of variables in numerical data are all done using statistical approaches. Deterministic approaches, in contrast to statistical methods, are suitable when observations can be precisely replicated or are thought to be capable of doing so. Through statistical analysis, theoretical models, such as probability distributions or models used in regression analysis, are connected to observed statistical data. One can judge the worth of the information gathered and the degree to which the information can be applied to comparable situations by estimating parameters in the proposed model and testing assumptions about competing models. The application of the model based on the estimated values of the parameters is known as statistical prediction.

6.7 Survey Organization

The number of responses with complete information was one of the research study's main concerns.

Another major concern was the respondents' understanding of the advantages and applications of this research study. The process of creating the questionnaire was started using the following criteria: Understanding, exactness, and complete information

The questionnaire is designed for about 10 minutes; a duration of 2 weeks is set for completion.

Provide a questionnaire and also keep the questionnaire effective and simple for respondents.

6.8 Questionnaire methods

The practice of creating questionnaires advanced through communication; it was divided into the respondent's profile and several elements impacting worker productivity in building

construction.

The respondent profile contains questions designed to elicit data about the respondent's job title, work history, current and/or past work locations, and contact information.

These survey questions were examined, and it was found that they were crucial to the study's analysis of worries about productivity loss from a range of distinct profiles from various geographical areas.

The factors influencing worker productivity in the five different categories were the focus of the inquiry. It contained elements that affected worker productivity.

Respondents merely provided information on elements that affect productivity under a certain standard setting and how to improve it.

6.9 Questionnaire Distributions

The professionals in the construction business were the study's target groups. The Engineering News-Record provided a list of 200 construction buildings in different cities in Saudi Arabia.

ANOVA analysis of survey or experiment results can be used to identify the causes of low labor productivity in the construction industry and suggest ways to raise it. (KENTON, 2023)

6.10 the sample size

The sample size is the total number of replies to this research survey that have been completed. It is referred to as a sample since it only reflects a portion of the target market, which in KSA consists of more than 2 million construction workers and more than 250,000 engineers and supervisors. A "random sample," for instance, is a sampling technique in which respondents are randomly selected from among the engineers and supervisors working in the construction industry by using the following formula:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

N = population size • e = Margin of error (percentage in decimal form) • z = z-score

Desired confidence level	z-score
80%	1.28
85%	1.44
90%	1.65
95%	1.96
99%	2.58

So, our sample will be 754 as below calculated which distributed as following:

- Face to face interview numbers will be 254.
- E-mail survey numbers will be 300.
- WhatsApp survey will be 200.

Population Size ⓘ	Confidence Level (%) ⓘ	Margin of Error (%) ⓘ
250000	90	3
Sample size 754		

7 Results and analysis

Once you have results, we can effectively analyze them using all the data analysis tools available to you, including statistical analysis, data analytics, and charts and graphs that capture your survey metrics. We'll want to start by relying on the survey methodology in order to achieve your survey goals.

7.1 Data Analysis and Findings

Too many open-ended questions might complicate and lengthen your study because they lead to qualitative, non-numerical results. Conversely, findings from closed-ended questions are simpler to interpret.

7.1.1 Steps for Data analysis

There are six steps for calculating and creating survey results, but we will use cross-tabulation and filtering results for this issue.

When modeling data, another technique for data analysis is to use a filter. Filtering entails focusing only on one particular subgroup while excluding all others. So, in this case, we're just focusing on how one subgroup responded to the question rather than comparing subgroups to one another. You may get pinpoint accuracy in your data by combining filters.

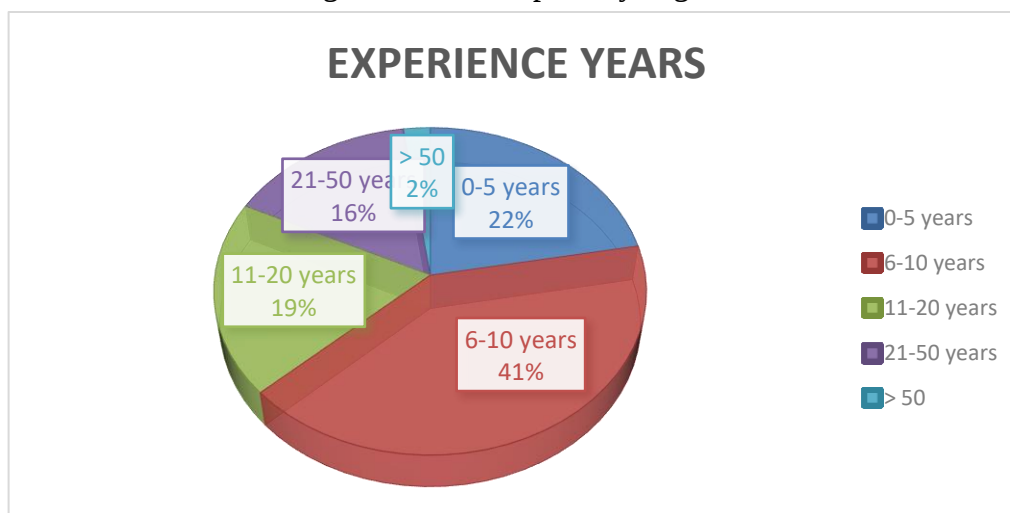
For instance, we could limit your focus to those who connect with construction laborers on sites. One thing to be wary of as you slice and dice your results is that every time you apply a filter or cross-tab, the sample size decreases. To make sure results are statistically significant, it may be helpful to use a sample size calculator.

A total survey of 754 The number of results of 29 was excluded due to the lack of communication with the workers directly at the contracting sites, and they are also considered to be from the top management, which is far from the sites.

Location	Survey type	Position	Numbers
Jeddah/ Riyadh	Face to face	site engineers	48
Jeddah/ Riyadh	Face to face	Forman's	75
Jeddah/ Riyadh	Face to face	supervisor	71
Jeddah/ Riyadh	Face to face	construction manager	37
Riyadh / Jeddah	Face to face	project manager	23
Qassim / Arrear / Taif	E-mail	site engineers	86
Qassim / Arrear / Taif	E-mail	supervisor	120
Qassim / Arrear / Taif	E-mail	construction manager	19
Qassim / Arrear / Taif	E-mail	project manager	21
Qassim / Arrear / Taif	E-mail	Forman's	54
Abha / Damam / Dharan	WhatsApp	site engineers	68
Abha / Damam / Dharan	WhatsApp	project manager	15
Abha / Damam / Dharan	WhatsApp	construction manager	22
Abha / Damam / Dharan	WhatsApp	supervisor	95
Total			754
excluded			29
Net Total			725

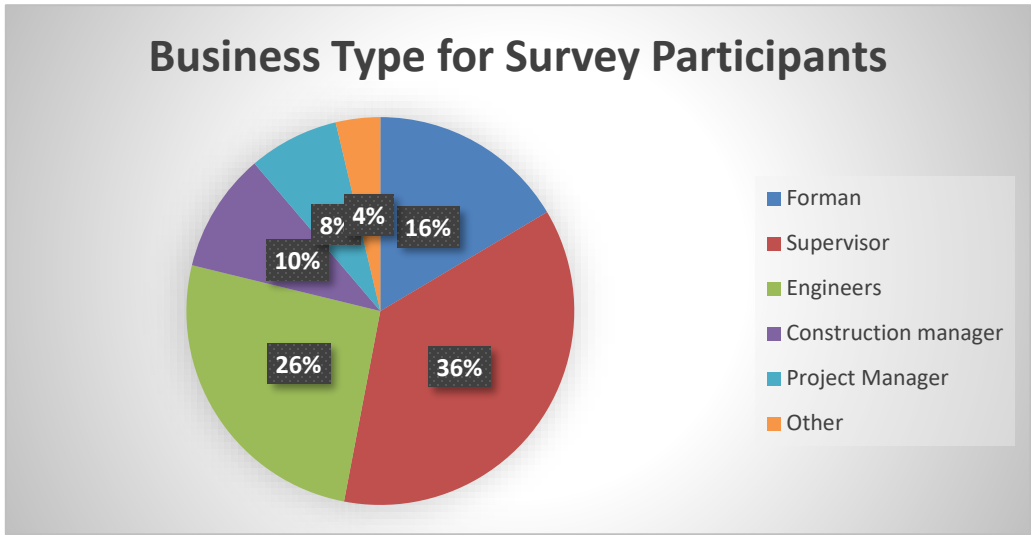
7.1.2 analysis for experience years of Survey Participants

The following chart shows the analysis for experience years of survey participants. It appears that more than 40% of the participants in this survey had experience from 6 to 10 years, which indicates that almost all people in this field, after 10 years of experience, had moved to administrative work and management work, especially engineers.



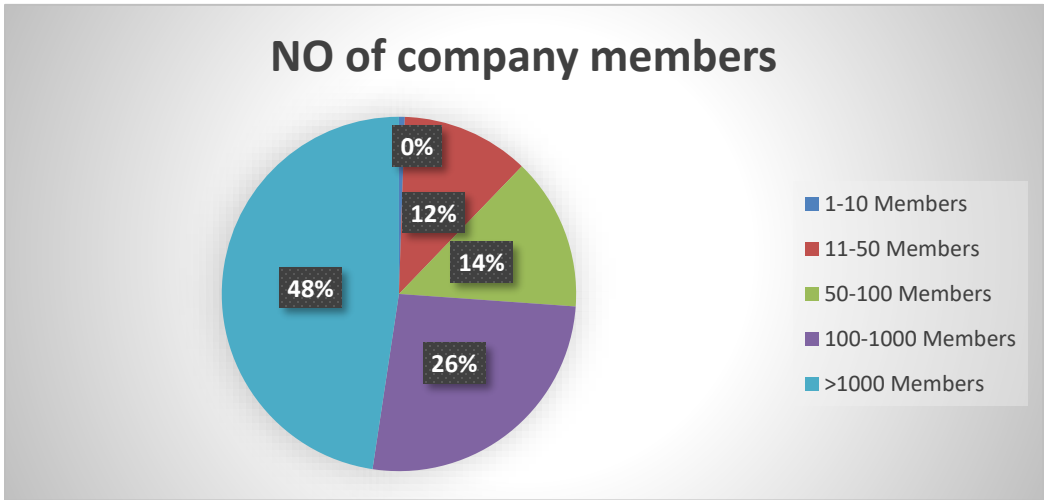
7.1.3 Business type for Survey Participants

The following chart shows the analysis for business type for survey participants, and it appears that more than 36% of the participants in this survey work as supervisors (direct work with labor).



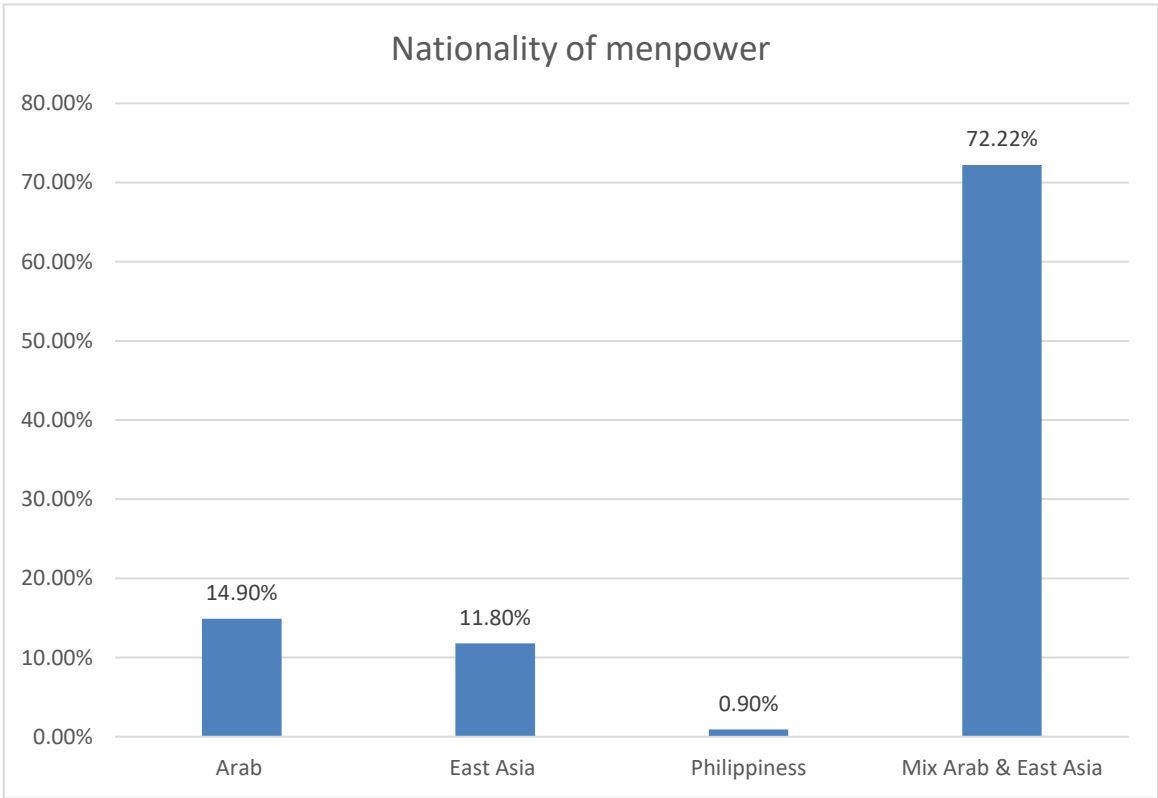
7.1.4 Total Staff Member Company for Survey Participants

The following chart presents the total members in construction companies of survey participants, which the result of this survey is the confirmation that the construction industry is a labor-intensive industry, with 48% of total companies having more than 1000 employees and 26% having between 100 and 1000 employees.



7.1.5 which high productivity nationality & quality in KSA Market

From the results of the survey analysis, it appears that 72% of company staff in the Saudi construction market are mixed nationalities from Arab and East Asia, which is the highest productivity of other nationalities. This is because the weather is similar to the hot weather in Saudi Arabia, and also because of their large bodies compared to other nationalities. There are also comments about this when comparing this percentage to the total for companies that employ more than 100 and 1000 individuals, which is approximately the same percentage.



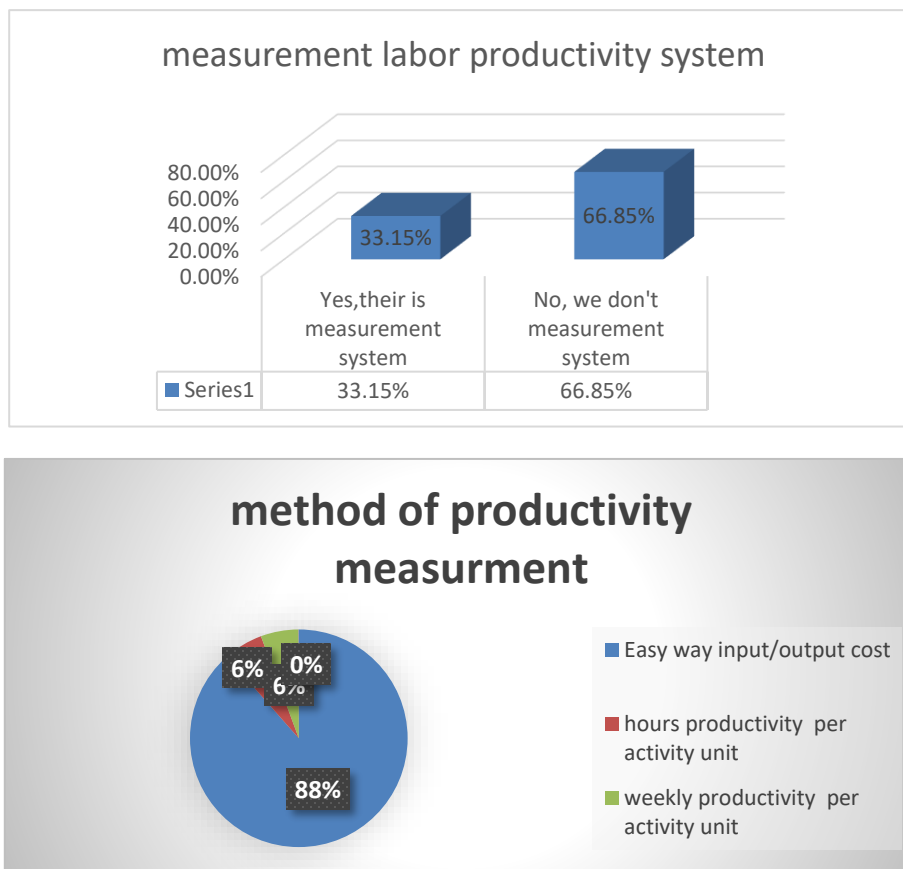
7.1.6 Measurement of labors productivity in Participants company

All methods were limited from all surveys to a percentage of construction companies that measure labor productivity, and how? As a result of the survey, there are 67% of construction companies without a labor productivity measurement system. This result explains the repeated complaints from construction companies about the lack of labor productivity due to the lack of a

production measurement system to know whether the laborers work hard or are lazy, or whether the project requires a larger number of laborers to achieve the target.

The companies that have a labor productivity measurement system and represent 33% of the total research survey of construction companies already use a sample method for productivity

Measurement by away (input cost / output cost) with 88% and 12% use hard ways as per below chart.



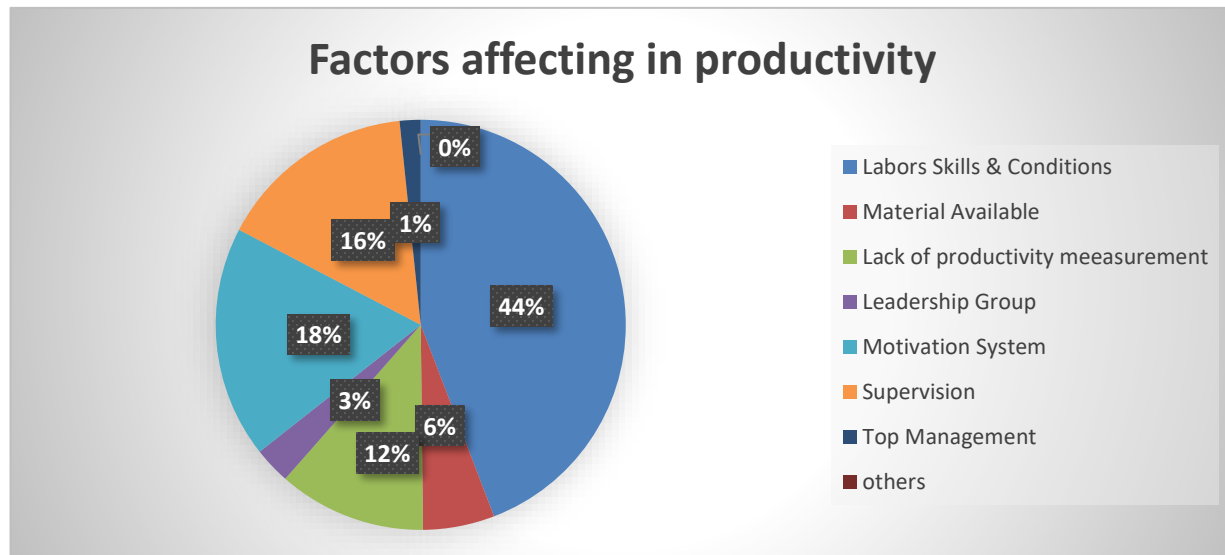
7.1.7 The factors affecting in labor productivity in construction field

According to the results of the survey, we find that the three most influential factors in the productivity of labor in construction companies are as follows:

- labor skills and conditions by 44%.
- There is a motivation system of 18%.

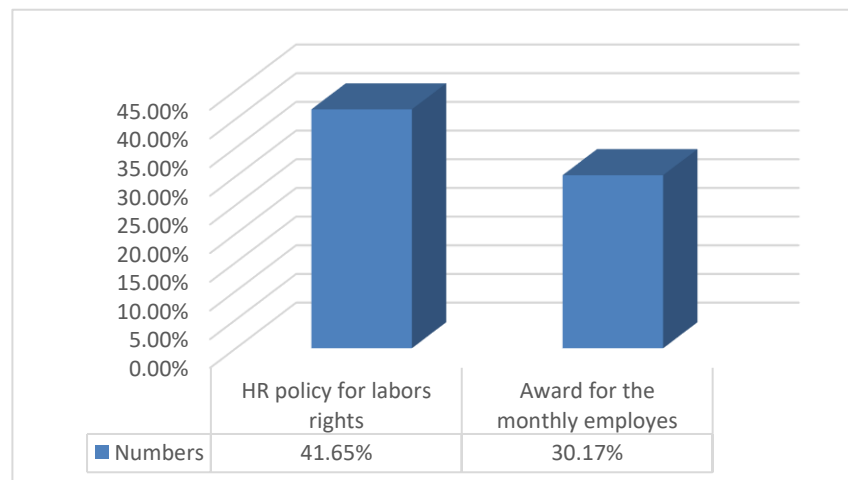
- supervision system or organization by 16%.

All three of the aforementioned factors account for 78% of the effect on construction labor productivity.



7.1.8 the percentage of motivation system in survey Participants company

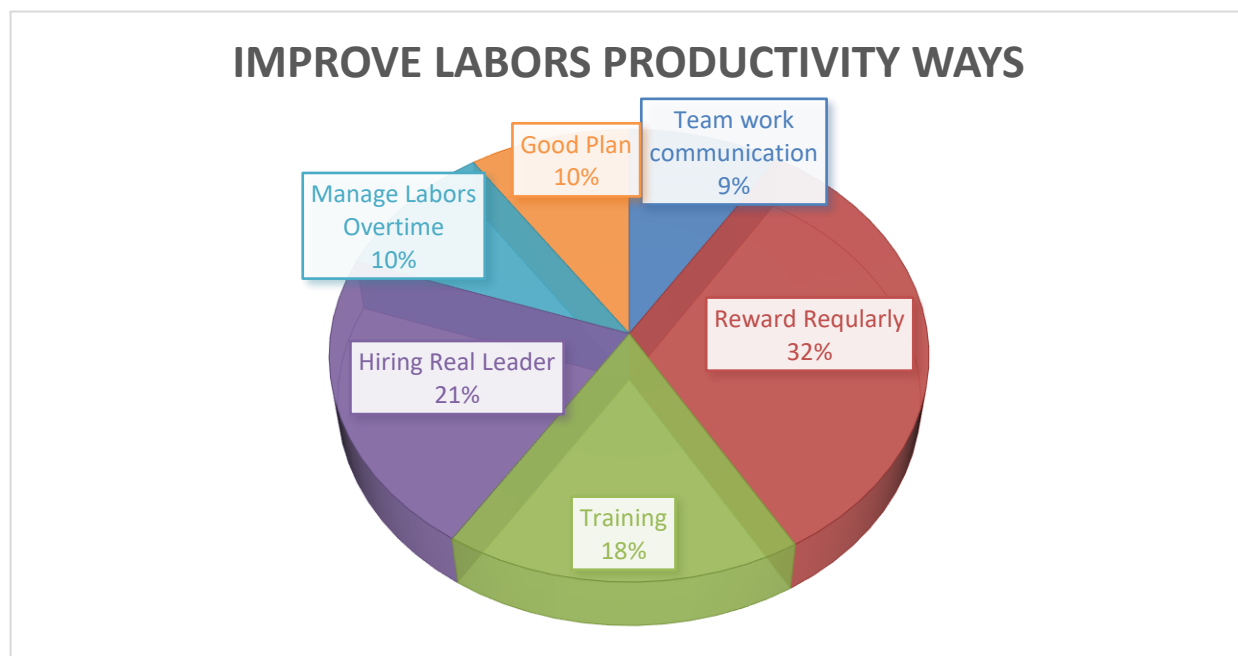
The percentage of the existence of a motivation system (financial or moral) in construction companies, according to this research survey, was only 37% of the total construction companies in Saudi Arabia. This explains the lack of loyalty among labors and the transfer of many labors between contracting companies in Saudi Arabia according to the increase in salaries due to the lack of a sense of stability and loyalty.



7.1.9 Labors productivity improvement methods

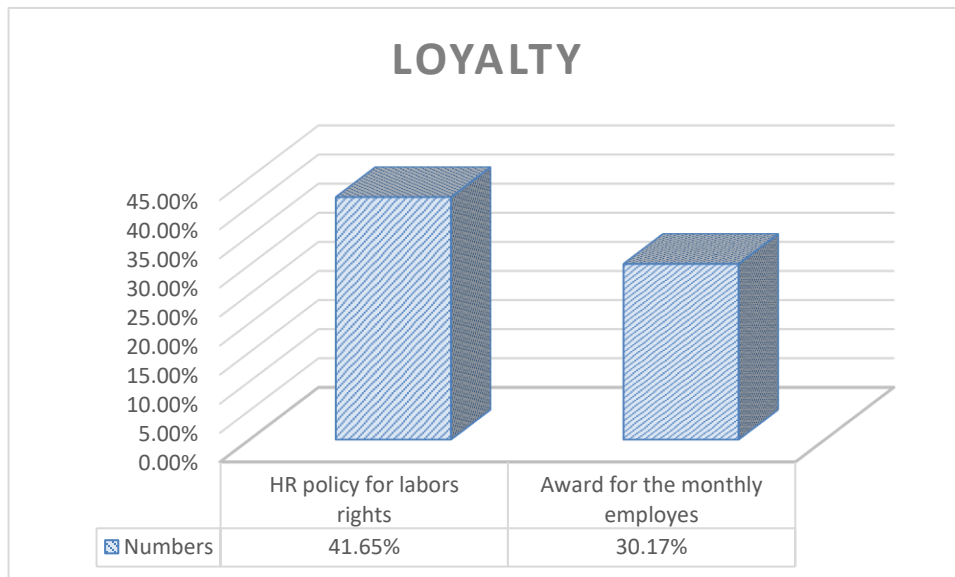
Regarding the research survey, the best three ways to improve construction labor's productivity are as follows:

- There is a reward system.
- Hiring a real leader.
- Training system for labor



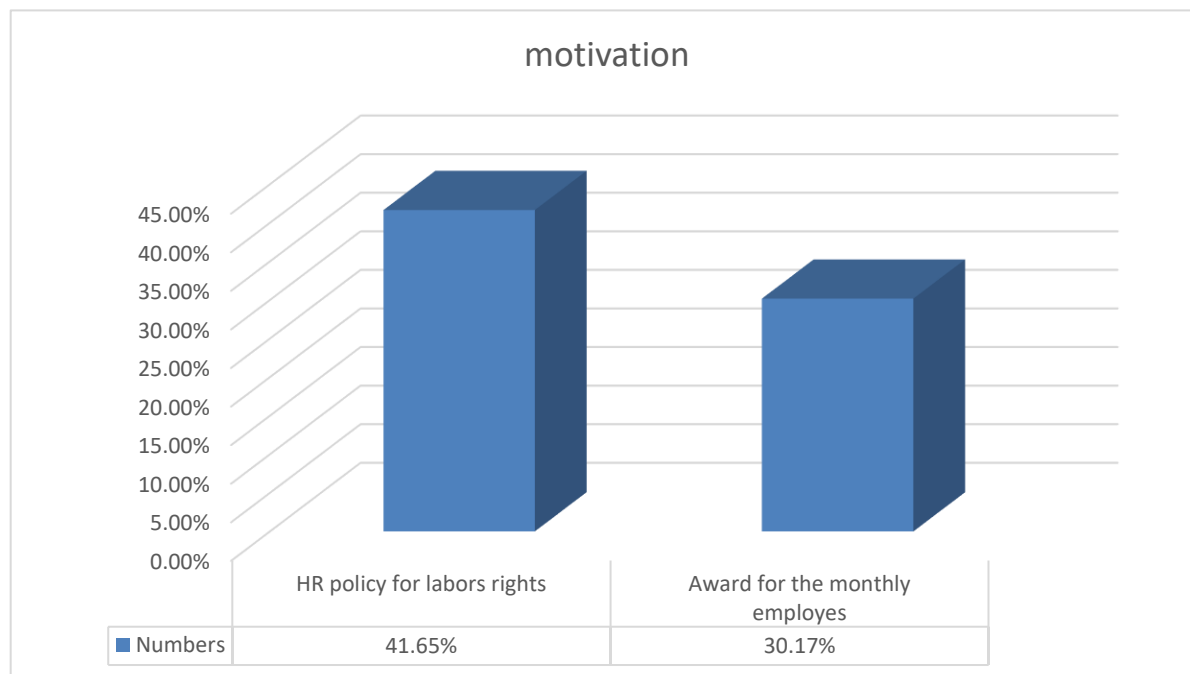
7.1.10 Construction Labor loyalty percentage.

According to the survey, the percentage of loyalty among laborers in construction companies was measured at 31%; this result is very close to the percentage of the existence of a motivation system in companies, and there is a strong correlation between motivation and loyalty.



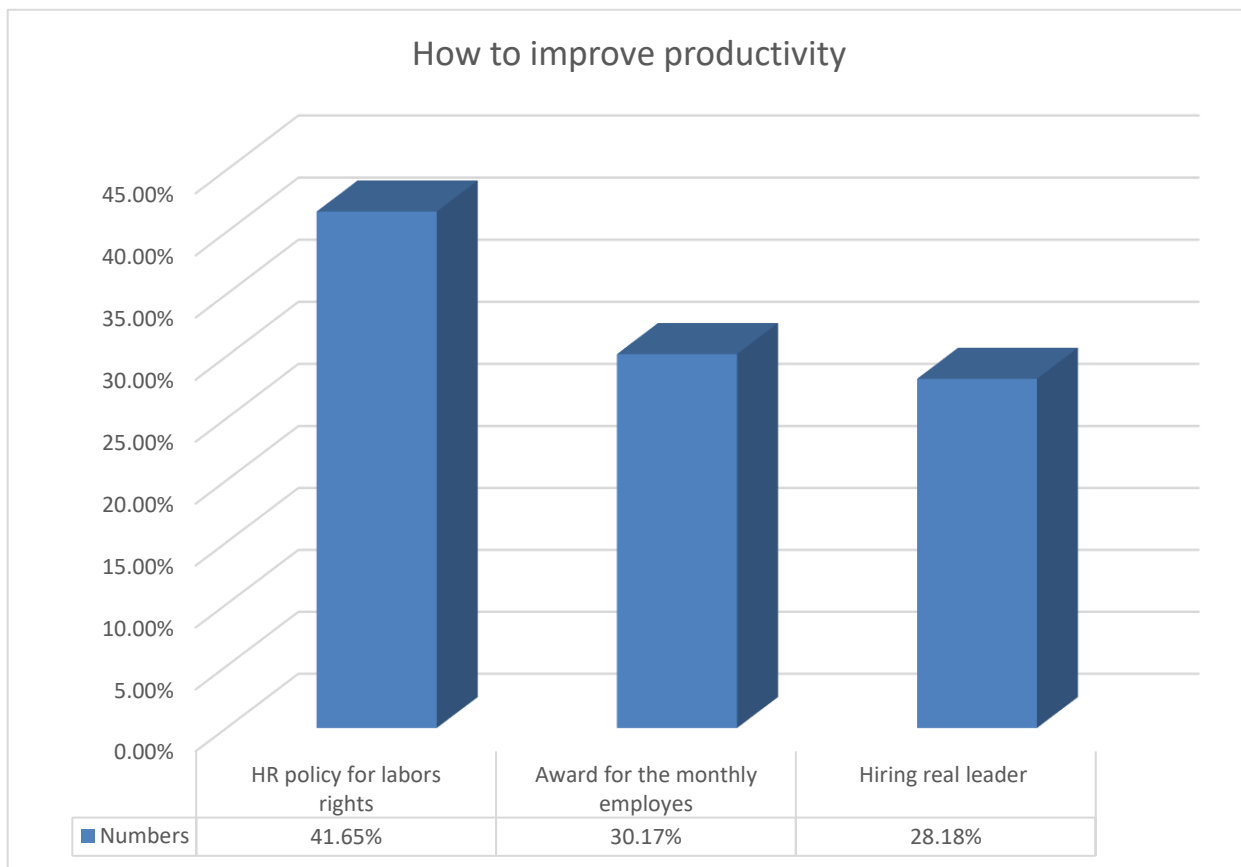
7.1.11 If create new motivation system will help to increase labor productivity (yes or NO)

More than 80% confirmed that the motivation system raises the productivity of workers on site because it is considered an expression of appreciation for their efforts from their company, and the company sees all the efforts of its labors.



7.1.12 How to improve the labors productivity

More than 67% of the participants in the research survey support that the bonus system based on productivity rate is the best way to increase labor's productivity, so each crow with a daily productivity rate should finish it. If the daily productivity exceeds the specified amount, a bonus is calculated on the increased quantities according to the company's system.



7.1.13 Methods of raise team work (labors) loyalty

The results were very close in the sense that the three options should be used together to raise the loyalty of the team: the existence of a HR policy that preserves the rights of labor and the employees' sense of that; the presence of an award for the best employee in each monthly and annual department; and finally, the presence of a leader for each department and not just a manager

who creates loyalty between all team members and the company.



8. Conclusion

This search's goal was to assess how productive construction workers are and how that affects organizational profit. Different types of influencing elements, including labor and operating management, supervision, planning, leadership, extrinsic incentives, and individual or team incentives, exist fundamentally.

Measuring the productivity of workers is very important to determine the reasons affecting this productivity and how to develop it. The conditions of labor as well as the work environment must be studied in order for the measurement of productivity to be accurate, as well as the factors affecting labor's productivity.

After identifying the reasons affecting the productivity of workers and analyzing them in each site and each activity separately, a plan can be made to develop productivity, develop workers, and increase their self-confidence.

After identifying the reasons affecting the productivity of workers and analyzing them in each site and each activity separately, a plan can be made to develop productivity, develop workers, and increase their self-confidence.

The use of incentives has a variety of benefits, with higher organizational productivity being an essential outcome of motivating employees. The analysis demonstrates that incentives increase organizational productivity by having a favorable effect on the key factors affecting organizational performance.

Employee productivity, employee engagement, innovation and creativity, organizational commitment, and job satisfaction are the factors that incentives to boost organizational productivity have an impact on. Using these factors to your advantage and supplementing them with incentives boosts organizational productivity. However, the use of incentives has come under criticism in the literature because it might foster individualism, a sense of entitlement to financial

benefits, and low employee engagement during economic downturns. In general, giving rewards to employees is essential for raising organizational productivity. As a result, the company should take advantage of the numerous incentive programs and initiatives as a means of increasing production, which it is very important to discuss with labors in the reasons of waste of their time work as material transferring, time also leader should make them as partners in any progress, also Construction Managers had soon run out of excuses, however, and were forced to realize that labor productivity was dropping even on jobs where there was no acceleration, and have therefore started to relate productivity with motivation, or the lack of it.

In recent years, no big building has been put up on time. No big building now being built is on schedule, The delay ranges from 20% to 50% increasing on time, it is the result of almost unbelievably low levels of productivity which believing that labors can spend eight hours on a site but work only less than 4 hours work in the whole day.

So, the best way to improve the productivity in construction industry, it is creating A good reward system with no injustice to anyone who started working for the engineers responsible for managing construction sites also reward system must be made public and the workers feel that they are partners in success and failure and any benefit for company will reflect on them.

This case labors will turn to be stakeholders; not ordinary employees wait for monthly salary.

9. References

Bibliography

- Ibbs, W. (2005). Impact of Change's Timing on Labor Productivity. *Impact of Change's Timing on Labor Productivity*.
- Small, E., & Baqer, M. (2016, June 28). Examination of job-site layout approaches and their impact on. *Examination of job-site layout approaches and their impact on*, p. 6.
- Tammy, N. J., Medani, M. M., Ramli, R., Yunus, J., & Mohd Noor, R. H. (2020, January). Evaluation of Human Factors Influencing Labor Productivity in Construction Project. *Evaluation of Human Factors Influencing Labor Productivity in Construction Project*.
- Abbasnejad, B. (2013, (August). AReview of Challenges Associated with Productivity in Construction. *AReview of Challenges Associated with Productivity in Construction*.
- CHODAKOWSKA, E., & NAZARKO, J. (2016, December 11). ENVIRONMENTAL DEA METHOD FOR ASSESSING PRODUCTIVITY OF EUROPEAN COUNTRIES. *ENVIRONMENTAL DEA METHOD FOR ASSESSING PRODUCTIVITY OF EUROPEAN COUNTRIES*.
- Enshassi, A., Al-Halaq, K., & Abu Mustafa, Z. (2007, june 06). LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS. *LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS*.
- Enshassi, A., Al-Halaq, K., & Abu Mustafa, Z. (2007, jan 16). LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS. *LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS*.
- Enshassi, A., Al-Halaq, K., & Abu Mustafa, Z. (2007, June 06). LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS. *LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS*.
- Enshassi, A., Al-Halaq, K., & Abu Mustafa, Z. (2017, may 17). LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS. *LABOR PRODUCTIVITY MEASUREMENT IN BUILDING PROJECTS*, p. 11.
- Fowler, F. J. (1993). Survey Research Methods , second edition. *Survey Research Methods, second edition*, p. 156.

Grau, D., Caldas, C. H., Haas, C. T., Goodrum, P. M., & Gong, J. (2009). Impact of Fast Automated Tracking of Construction Components on Labor . *Impact of Fast Automated Tracking of Construction Components on Labor* .

<https://www.tutor2u.net/business/reference/labour-productivity>. (22 Mar 2021, 22 Mar 22). Retrieved from <https://www.tutor2u.net/business/reference/labour-productivity>.

Ibbs, W., & Sun, X. (2016, April). Use of Mechanical Contractors Association of America Method in Loss of Productivity Claims. *Use of Mechanical Contractors Association of America Method in Loss of Productivity Claims*.

J, S., & N, H. (2017, NOV 11). REVIEW ON PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION. *REVIEW ON PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION*, p. 6.

KENTON, W. (2023, june). Analysis of Variance (ANOVA) Explanation, Formula, and Applications. *Analysis of Variance (ANOVA) Explanation, Formula, and Applications*.

Liberda, M., Ruwanpura, J., & Jergeas,, G. (2012, april 26). Construction Productivity Improvement: A Study of Human, Management and External Issues. *Construction Productivity Improvement: A Study of Human, Management and External Issues*.

Murodif, A., Erizal, & Widyarti, M. (2016). Measurement of Productivity Using Work Sampling Method at Menara Sentraya. *Measurement of Productivity Using Work Sampling Method at Menara Sentraya*, p. 5.

Muthukrishnan, N., & Ganapathi, R. (2001, july 7). A Study On Risk Management Practices In Construction Projects In India. p. 14.

Sweis, G., Sweis, R. J., Abu Hammad, A., & Abu Rumman, M. (2009, January). Modeling the Variability of Labor Productivity in Masonry Construction. *Modeling the Variability of Labor Productivity in Masonry Construction*.

Thomas, J. (2023, May). Productivity Analysis of Structural Steel Fabrication in Construction Using Simulation. *Productivity Analysis of Structural Steel Fabrication in Construction Using Simulation*.

V. J, S., & M. N., H. (2017, NOV 11). A REVIEW ON PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION. A
REVIEW ON PRODUCTIVITY IMPROVEMENT IN CONSTRUCTION.

10. Appendix

Q1: what are your total experience years in construction field?

- ✓ 0–5 years.
- ✓ 6–10 years.
- ✓ 11–20 years
- ✓ 21–50 years
- ✓ > 50 years.

Q2. What kind of your business in construction field (select only one answer)?

- ✓ Forman.
- ✓ Supervisor.
- ✓ Engineer.
- ✓ Construction Manager.
- ✓ Project Management.
- ✓ Others.

Q3. What is the total number of staff members in your construction company (select only one answer)?

- ✓ 1–10 employees
- ✓ 11–50 employees

- ✓ 50–100 employees
- ✓ 100–1000 employees
- ✓ > 1000 employees.

Q4. What is almost nationality of staff members in your company (Select only one item)?

- ✓ Arab (Egyptian, Syrian, Jordan).
- ✓ East Asia (Bangladesh, India, Pakistan).
- ✓ Philippines.
- ✓ MAX between Arab & East Asia.

Q5. Is there a Labors productivity measurement system in your company?

- ✓ YES, we have.
- ✓ NO, we did not have.
- ✓

Q6. Select your company measurement system for labors productivity from below following?

- ✓ Easy way input/output cost.
- ✓ hours productivity per activity unit.
- ✓ weekly productivity per activity unit.
- ✓ Cost of items per area /villa/ apartment.

Q7: Choose only the most three factors affecting in productivity of construction labors?

	Labors skills, conditions
	Material
	Motivation system
	Lack of productivity measurement
	Leadership
	Supervision
	Top Management
	others

Q8. Is there in your company financial or in-kind incentives for members of the work team in the sites of workers, supervisors or engineers from the Top management?

- ✓ Yes
- ✓ No

Q9: How to improve labors productivity in construction sites?

- ✓ Reward Regularly.
- ✓ Training.
- ✓ Good Planning.
- ✓ Hiring Real Leader.
- ✓ Manage Labors Overtime.
- ✓ Team Work communication.
- ✓ Others.

Q10. Is there labors loyalty in your company staff depend on your daily dealings with staff?

- ✓ YES, I think that.
- ✓ NO, I don't think that.

Q11.If your company Create motivation system for construction labors, do you think that will help to improve them productivity?

- ✓ YES, I will.
- ✓ NO, I don't think that.

Q12: Select one of the following three motivation system to help your company to increase labors productivity with the required quality.

- ✓ Increase overtime.
- ✓ Bonus System depend on productivity rate.
- ✓ Reward per activity unit.

Q13. How to raise the loyalty of all labors, Select the best way to raise labors loyalty from following?

- ✓ HR policy Help Labors obtain their rights on time.
- ✓ Award for the best employee of the month in each site and each department.
- ✓ Real Leader encourages labors.