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The Effect of Labor Management by Contracting Companies on the Quality of Projects in the Gaza Strip-Palestine

تأثير إدارة العمال من قبل شركات المقاولات على جودة المشاريع
في قطاع غزة-فلسطين

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إقرار

أنا الموقع أدناه مقدم الرسالة التي تحمل العنوان:

The Effect of Labor Management by Contracting Companies on the Quality of Projects in the Gaza Strip- Palestine

تأثير إدارة العمال من قِبَل شركات المقاولات على جودة المشاريع في قطاع غزة - فلسطين

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بناءً على موافقة عمادة البحث العلمي والدراسات العليا بالجامعة الإسلامية بغزة على تشكيل لجنة الحكم على أطروحة الباحث/ لمجد غازي جمعه مزيد لنيل درجة الماجستير في كلية الهندسة/ قسم الهندسة المدنية/إدارة المشروعات الهندسية وموضوعها:

تأثير إدارة العمال من قبل شركات المقاولات على جودة المشاريع في قطاع غزة - فلسطين

The Effect of Labor Management by Contracting Companies on the Quality of Projects in the Gaza Strip - Palestine

وبعد المناقشة التي تمت اليوم الاربعاء 28 جمادي الأولى 1439 هـ الموافق 2018/02/14م الساعة العاشرة صباحاً، في قاعة اجتماعات كلية الهندسة اجتمعت لجنة الحكم على الأطروحة والمكونة من:

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وبعد المداولة أوصت اللجنة بمنح الباحث درجة الماجستير في كلية الهندسة/قسم الهندسة المدنية/إدارة المشروعات الهندسية.

واللجنة إذ تمنحه هذه الدرجة فإنها توصيه بتقوى الله تعالى ولزوم طاعته وأن يسخر علمه في خدمة دينه ووطنه.

والله ولي التوفيق،،،

عميد البحث العلمي والدراسات العليا

أ.د. مازن إسماعيل هنية



Abstract

Purpose: The construction industry is one of the largest global employment sectors. It plays significant role in the economic development. The purpose of the research is to provide guidelines for effective labor management methods that enhance project quality in contracting company. In achieving this aim, four objectives have been outlined which includes: assessing the current situation of labor management in contracting companies, studying the factors affecting labors performance and its relationship with projects quality, Identifying the barriers face labor management and identify the most effective methods of managing labors to achieve high quality.

Design/methodology/approach: A quantitative and qualitative method was used in the research including questionnaire and case study. The questionnaire analyzed by using the quantitative data analysis techniques through the Statistical Package for Social Science (SPSS) IBM version 24. With regard to the case study, "Construction of commercial and administrative buildings" and "Rehabilitation of al-Shuhada Street" in Deir el Balah was studied to enforce the questionnaire results with the real world.

Findings: The study results indicated that the current situation of labor management in contracting companies have a moderate level. The factors affecting labors performance divided into three section, factors related to labors, factors related to company's management, and factors related to project nature and all factors affecting positively in project quality. The top barrier that face labor management is: ineffective management, fragmentation of construction process and instability of political condition. Regarding the case study, findings indicated that a highly agreement between the results of the case study and the results of the questionnaire. Finally the majority of best strategies for managing workers are useful and the top rank are: maintain work discipline, on time payment to the worker, use automated system and new technology, and motivate and facility to the workers.

Theoretical and Practical Implications of the Research: This study can provide a reference for studying the effective labor management practices in order to obtain a high quality in construction projects. In addition, this study will allow construction contracting companies to understand where they fall within high quality competition and human resource issues and to devise a strategy to be developed to attain higher levels of project quality.

Originality/Value: This study presents the first investigation into labors management aspects in local construction industry, especially its effect in project quality. It open the door for more discussion about all subjects related to labors recruited methods, productivity and motivation in construction. Also can be of immense benefit to policy makers and construction industry practitioners (clients, contractors and consultants) and academicians.

Keywords: labor management, projects quality , construction industry, Gaza Strip

الملخص

الغرض: صناعة البناء والتشييد هي واحدة من أكبر قطاعات التوظيف العالمية ، وتلعب دوراً هاماً في التنمية الاقتصادية. والغرض من هذا البحث هو تزويد شركات المقاولات بالمبادئ التوجيهية لأساليب الإدارة الفعالة للعمال التي تعزز جودة المشاريع الانشائية. ولتحقيق هذا الغرض، تم تحديد أربعة أهداف تشمل: تقييم الوضع الحالي لإدارة العمال في شركات المقاولات، ودراسة العوامل المؤثرة على أداء العمال وعلاقتها بجودة المشاريع، وتحديد العقبات التي تواجه إدارة العمال، وكذلك تحديد الأساليب الأكثر فعالية في إدارة العمال لتحقيق جودة عالية.

منهجية البحث: تم استخدام البحث الكمي والكيفي في هذا البحث وذلك باستخدام الاستبانة ودراسة الحالة. حيث تم تحليل الاستبانة باستخدام تقنيات التحليل الكمي للبيانات ، وذلك باستخدام برنامج (SPSS). وفيما يتعلق بدراسة الحالة تمت الدراسة لمشروعين "بناء المبنى التجاري والإداري" و "إعادة تأهيل شارع الشهداء" في مدينة دير البلح لتعزيز نتائج الاستبانة على العالم الحقيقي.

النتائج: أظهرت نتائج الدراسة أن الوضع الحالي لإدارة العمال في شركات المقاولات له مستوى متوسط. وبينت أن العوامل المؤثرة على أداء العمال مقسمة إلى ثلاثة أقسام: عوامل متعلقة بالعمال، وعوامل متعلقة بإدارة الشركة، وعوامل ذات صلة بطبيعة المشروع. وجميع العوامل تؤثر بشكل إيجابي على جودة المشروع. وأوضحت أن أبرز العوائق التي تواجه إدارة العمال هي: الإدارة غير الفعالة، وتشنت صناعة الإنشاءات، وعدم استقرار الحالة السياسية. وفيما يتعلق بدراسة الحالة، أشارت النتائج إلى وجود توافق كبير بين نتائج دراسة الحالة ونتائج الاستبيان. وأخيراً فإن معظم الاستراتيجيات المذكورة لإدارة العمال مفيدة ومن أبرزها: الحفاظ على الانضباط في العمل، ودفع الراتب للعامل في وقته ، واستخدام النظام الآلي والتكنولوجيا الحديثة ، والتحفيز والتسهيلات المقدمة للعمال.

الآثار النظرية والعملية للبحث: يمكن أن توفر هذه الدراسة مرجعاً لدراسة الممارسات الفعالة لإدارة العمال من أجل الوصول الى جودة عالية في مشاريع البناء. وبالإضافة إلى ذلك، سوف تسمح هذه الدراسة لشركات المقاولات الإنشائية أن تفهم أين موقعها في إطار المنافسة العالية على الجودة وقضايا استثمار الموارد البشرية، ووضع وتطوير استراتيجية لتحقيق أعلى مستويات جودة المشروع.

قيمة الدراسة: تعتبر هذه الدراسة أول دراسة في تحقق في جوانب إدارة العمالة في صناعة البناء المحلية، وبخاصة تأثيرها على جودة المشاريع. وستعمل على فتح الباب لمزيد من النقاش حول جميع الموضوعات المتعلقة بتوظيف العمال وإنتاجيتهم وطرق تحفيزهم. كما يمكن أيضاً أن تكون ذات فائدة كبيرة لصانعي السياسات والممارسين في صناعة البناء والتشييد (العملاء والمقاولين والاستشاريين) والأكاديميين.

وَضَرَبَ اللَّهُ مَثَلًا رَجُلَيْنِ أَحَدُهُمَا أَبْكَمُ لَا يَقْدِرُ عَلَى
شَيْءٍ وَهُوَ كَلٌّ عَلَى مَوْلَاهُ أَيْنَمَا يُوَجِّههُ لَا يَأْتِ بِخَيْرٍ هَلْ
يَسْتَوِي هُوَ وَمَنْ يَأْمُرُ بِالْعَدْلِ وَهُوَ عَلَى صِرَاطٍ مُسْتَقِيمٍ ﴿٧٦﴾

[النحل : 76]

Dedication

I would like to dedicate this research:

- ✓ *To my beloved father and mother for their endless support and unlimited Encouragement. Without their prayers, this work would not have been made possible.*
- ✓ *To my dear wife for her continuous inspiration that I will never forget.*
- ✓ *To my children (Hamza, Ghazy and Sabah) who were missing my direct care during my study.*
- ✓ *To all my brothers, sisters and family*
- ✓ *To all colleagues and friends for their sustainable support.*

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List of Abbreviations

CQ	Conformance Quality
GDP	Gross Domestic Product
HR	Human Resource
HRM	Human Resource Management
LMP	Labor-Management Partnership
LMR	Labor-Management Relations
LMS	Labor Management System
OHS	Occupational Health and Safety
PCBS	Palestinian Central Bureau of Statistics
PCU	Palestinian Contractors Union
SQ	Service Quality
TQM	Total Quality Management

Chapter (1)

Introduction

Chapter 1

Introduction

This chapter is aimed to give an introductory overview of the research problem by giving background to the subject area. Also, this chapter included aim, objectives, research hypothesis. In addition, Methodology outline, research delimitations, and research contribution to knowledge as well as the Thesis structure were included in this chapter.

1.1Background

Construction is a labor intensive as well as craft-based activity and the behavior of people has an enormous influence upon the organization and performance of construction firms (Lill, 2008). The construction industry is one of the largest global employment sectors, providing work for a significant proportion of the labor market and accounting for a significant share of the world gross domestic product (GDP). The industry also represents one of the most risky, complex and dynamic industrial environments. A construction project relies on skilled manual labor supported by a management framework, which has to coordinate many professional, construction and supplier organizations whose sporadic involvement will change through the course of the project. The fragmentation and dynamism of this process and the need to integrate a wide range of occupational cultures renders construction one of the most complex project-based industries in which to apply good human resource management (HRM) practices (Loosemore, Dainty, & Lingard, 2003).

Labor management is one of the important techniques used by managers in construction project management. A good project management in construction should vigorously pursue the efficient utilization of labor, material and equipment . With a proper labor management, the availability of labor will always sufficient to carry out all construction work and completed on time without any delaying of work. Thus, time and cost loses will be minimized (Hendrickson & Au, 2008).

Contracting companies are facing increased competition due to globalization, changes in technology, political and economic environments and therefore prompting these organizations to develop their employees as one of the ways to prepare them to

the increases above and thus enhance their performance . Organizations are facing a dynamic environment where the survival conditions are becoming draconian. Their success is tributary to their capacity to adapt their structures and establish viable relations with their surroundings (Nassazi, 2013). The dynamic nature of the labor market, including high labor mobility between companies , wide range of remuneration levels, and issues of seasonality further complicate the matter leading to planning difficulties (Liu & Wall, 2005).

Labor management is the process of channeling human energy and skills into achieving business objectives. Labor is the one that combines all the other resources namely materials, plant, equipment, and finance in order to produce the various construction products. The endeavor to control construction costs particularly in these hard economic times, must be geared towards better control and management of labor mainly because labor is the one resource that affects all the other resources and it is most susceptible to improvement. Consultants via specifications, control material and plant costs, and profit and overhead are generally controlled by the competition. This then leaves labor as the one resource open to improvement (Wachira, 2001).

To achieve world class quality, it is imperative that a company empowers its workers. Companies must develop and realize the full potential of their workforce and maintain an environment conducive to full participation, personal and organizational growth. This can be achieved through creating the appropriate human resource development through training, employee participation and involvement, building quality awareness among employees, and motivating employees (Shahraki, konarizadeh, Paghaleh, & Zarei, 2011).

1.2 Construction Sector

Construction sector has been considered as one of the most important sectors in the economies of all countries for its broad and intense linkages with other sectors which stimulate economic development in the country as a whole is a major generator of jobs and constitutes an important components in any nation's planning philosophy. Construction is borne out of politico-socio-economic considerations and hence, they have an immeasurable influence on construction technology and

management of projects efficiently and effectively Construction. The business is no longer restricted to construction of residential buildings or factories but has extended to a wide range of services like construction of residential and commercial complexes, shopping and entertainment malls, industrial and software parks / towns, regional and national highways, roads, bridges, sea ports, airports, irrigation and water treatment projects, canals and so on. The industry becoming increasingly more complex partly because the large number of parties involved including clients, users, designers, regulators, contractors, suppliers and others (Sathe, Patil, & Waghmare, 2017).

Construction industry depend on behavior and skill of worker and labors productivity which has an high influence upon the contracting company performance and quality of project. Construction makes a significant contribution to national economy, it creates employment (especially for the least skilled members of society), it plays a role in the development and transfer of technology, it creates many opportunities for enterprises, and it contributes directly to improving quality of life of users of its products (Bourne, Neely, Platts, & Mills, 2002) . Additionally, construction projects are growing larger and more complicated (Ogunlana, 2008). Construction is considered to be one of the most human actions that consumes resources and affects the environment, not only through the construction process but also during lifetime of structures and buildings (Salameh, 2012).

1.3 Statement of Problem

Contracting companies is considered the core for construction sector in Palestine and facing increased challenges due to different surrounding environments, political, social, technology etc. Therefore, success of companies prompting to use their resources effectively, especially the labor because any construction project is likely to require the services of workers with quite different skill also the performance of labor is usually linked to the performance of time, cost, and quality moreover labor management calls for skillful handling of thoughts, feelings and emotions.

Local construction projects suffered great losses in term of quality due to problems associated with performance of labor. From this point, knowledge and understanding of the various factors affecting in construction labor management and

obstruct a good labor management practice, is needed to determine the focus of a necessary steps in an effort to have advanced project performance , thereby increasing productivity and overall project quality.

This research is an attempt to study the current situation of labor management in contracting companies. An attempt is carried out to put guidelines for effective management methods in construction projects to achieve required quality.

1.4 Research Aim & Objectives

The aim of the research is to provide guidelines for effective labor management methods that enhance project quality in contracting company. In achieving this aim, four main objectives have been outlined as follows:

Research Objectives

To assess the current situation of labor management in contracting companies.

To study the factors affecting the performance of labors and its relationship with projects quality.

To Identify the barriers face labor management in contracting companies.

To identify the most effective methods of managing labors to achieve good quality.

1.5 Key Research Questions

It is useful to ask questions about labor management issue in contracting companies working in Gaza Strip. This research will try to answer about this questions, including:

- 1) What are the current situation and levels of application of labor management practice in local contracting companies?
- 2) What are the factors that affecting on the labor management practice in construction projects to achieve high quality ?
- 3) What are the barriers that prohibiting local contractor to adopt labor management in their construction activities?
- 4) What are the best ways in labor management to have high quality in projects construction?

1.6 Research Hypothesis

There is a relation between factors affected labor management to achieve high project quality and best labor management practice in construction industry.

According to Figure (1.1), the study contains five hypotheses:

Hypothesis 1 "H0": Null hypothesis: There is no significant statistical relationship at level ($\alpha \geq 0.05$) between factors related to labor and the best labor management practices to enhance projects quality.

Hypothesis 1 "H1": There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between factors related to labor and the best labor management practices to enhance projects quality.

Hypothesis 2 "H0": Null hypothesis: There is no significant statistical relationship at level ($\alpha \geq 0.05$) between the factors related to company's management and the best labor management practices to enhance projects quality.

Hypothesis 2 "H1": There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to company's management and the best labor management practices to enhance projects quality.

Hypothesis 3 "H0": Null hypothesis: There is no significant statistical relationship at level ($\alpha \geq 0.05$) between the factors related to project nature and the best labor management practices to enhance projects quality.

Hypothesis 3 "H1": There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to project nature and the best labor management practices to enhance projects quality.

Hypothesis 4 "H0": Null hypothesis: There is no significant statistical relationship at level ($\alpha \geq 0.05$) between all factors affecting in labor management and the best labor management practices to enhance projects quality.

Hypothesis 4 "H1": There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors affecting in labor management to achieve high project quality and the best labor management practices to enhance projects quality.

Hypothesis 5 "H0": Null hypothesis: There is no significant statistical attributed to the demographic data of the respondents and the way of their work at the level of ($\alpha \geq 0.05$) between the averages of their views on the subject of effect labor management by contracting company on project quality.

Hypothesis 5 "H1": There is a statistically significant differences attributed to the demographic data of the respondents and the way of their work at the level of $\alpha \leq 0.05$ between the averages of their views on the subject of effect labor management by contracting company on project quality.

1.7 Methodology Outline

In this research the following methodology will be used in order to achieve research objectives:

Stage 1: Literature Review:

A comprehensive review of the relevant literature will be undertaken in order to develop an understanding of previous work in the field of labor management and its impact on project quality.

Stage 2: Pilot Study:

Data collection will take the form of questionnaire. However, an initial pilot study will be conducted to test the validity of the questionnaire.

Stage 3: Main Survey Questionnaire :

The feedback from the pilot study should assist in finalizing the questionnaire and prepare the ground for the main survey. The questions will meet the areas mentioned in the objectives.

Stage 4: Case Study :

A case study for two existing projects will be implemented to enforce the questionnaire result with the real world.

Stage 5: Writing up:

This stage involves writing up the content of the dissertation and should cover all thesis structure.

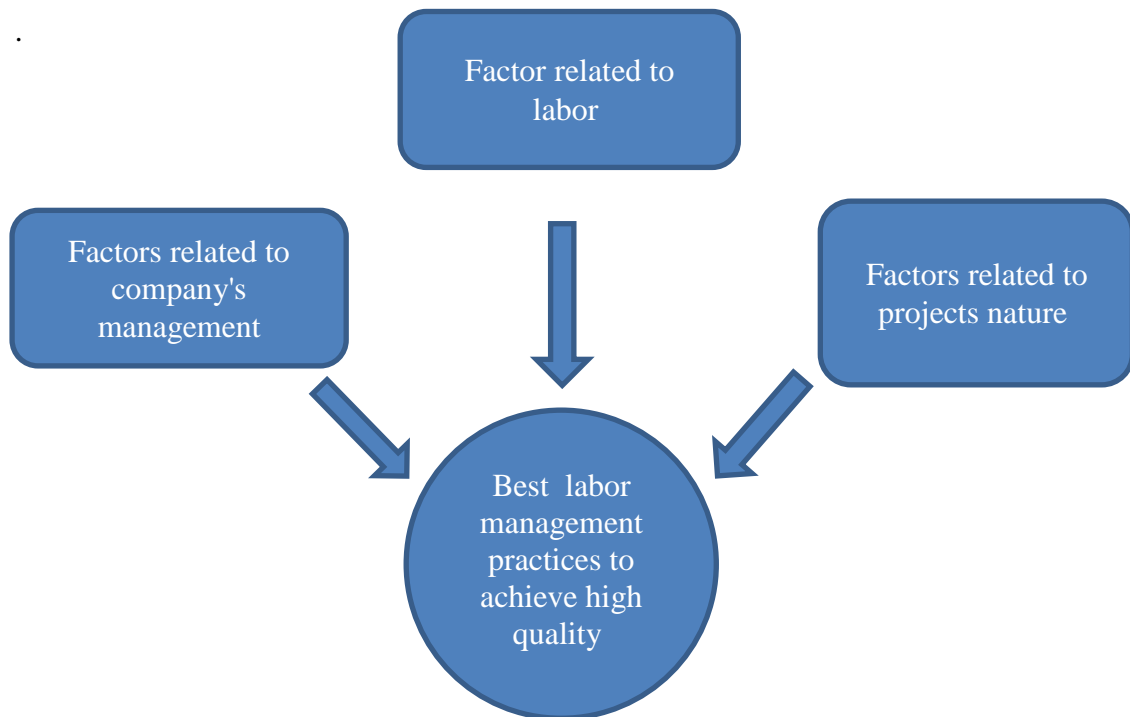


Figure (1.1) : Hypotheses model

1.8 Contribution to Knowledge

The research will add to existing knowledge on all over the world. The findings of this research can motivate applying effective method for managing the labor in Gaza Strip projects, as well as find innovative solutions to overcome productivity barriers and enhance the project quality. It is the first study in Gaza Strip that make comprehensively case study about this subject, It could be used as a comparative guide for future contracting company development and broadening understanding to increase knowledge of good labor efficiency and create a creative working environment.

1.9 Delimitations of the Study

The study covers the following central aspects:

Knowledge: The study focuses on methods of labor management in construction industry. It aimed only to develop a clear understanding about identifying basic factors (current situation of labor management, effective methods used, and barriers) in order to ensure high quality in construction project. According to that, Intensive literature review was conducted to review the previous studies made in this field and dealt with these factors.

Approach and Instrument: The research approach was a quantitative and qualitative survey research to measure objectives (descriptive survey and analytical survey). The research technique was shaped as a questionnaire and case study. The questionnaire and case study aimed to meet the research objectives, to cover the main questions of the study, and to collect all the necessary data that can support the results and discussion, as well as the recommendations in the research..

Geographical: The study carried out in Gaza Strip in Palestine. Gaza Strip consists of five governorates: the Northern governorate, Gaza governorate, the Middle governorate, KhanYounis governorate and Rafah governorate.

Population and Sample: Research population includes contracting company which classified first, second and third and the element is (company manager, project manager, site engineer). 88 of copies of the questionnaire had been distributed. Sample size was chosen to provide adequate information on reliability and a certain degree of validity.

Time: The questionnaire survey (distribution and collection) was conducted in September 2017. It was terminated in a period of one month.

1.10 Thesis Structure

Chapter 1 :-Introduction

This chapter will give an introduction about the research, it will include: introduction about the topic, problem statement, research hypothesis, aim and objectives, delimitations, methodology and thesis content.

Chapter 2 :-Literature Review

This chapter includes literature review about labor management, project quality in contracting companies, methods and tools lead to effective applying of labor management to achieve high quality.

Chapter 3 :-Methodology

This chapter will show the research design, research period and location, population, sample size, data collection, questionnaire design, pilot study and data measurement and analysis, testing of validity and reliability.

Chapter 4 :- Result and Discussion

This chapter will present the statistical questionnaire analysis and results, interviews results, discussion and interpretation of the results.

Chapter 5:-Case Study

This chapter present a case study that was applied in two construction projects in Gaza Strip to enforce the questionnaire result with the real world.

Chapter 5 :-Conclusion and Recommendations

This chapter will summarize the research results and conclusion, also it will give some recommendations.

References

Appendices

Chapter (2)

Literature Review

Chapter 2

Literature Review

This chapter described general concepts of labor management and also reported the previous studies in this field as well as the factors affected labor management, barriers, project quality in contracting companies, methods and tools lead to effective applying of labor management to achieve high quality.

2.1 Construction Sector in Palestine

Construction industry is one of the major economic sectors that has a high contribution towards the growth and development of the local economy of Palestine. It provides significant improvement in the overall GDP of the local economy, and contributes to the improvement of the quality of life by providing the required infrastructure such as schools, hospitals, roads and other basic (Enshassi & Ayyash, 2014).

Construction activities contributing 7.8% of GDP in Gaza Strip versus 7.4% in the West Bank (Figure 2.1). The value added in these activities totaled USD 601.1 million in 2016, being 5.9% higher than 2015, while the number of employed persons in the same activities increased by 12.6% compared to 2015 and reached 86.9 thousand in 2016.

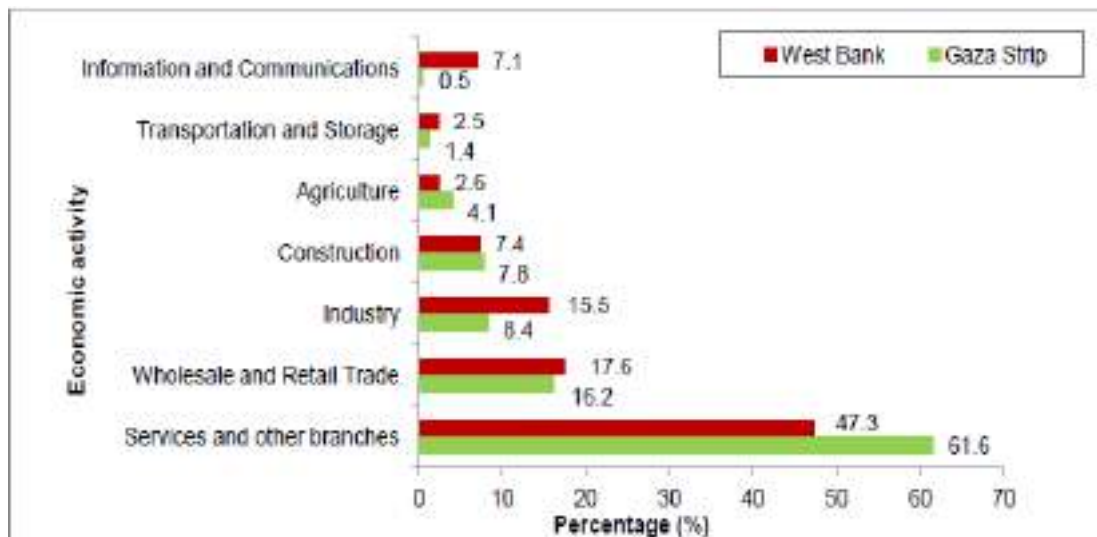


Figure (2.1) : Percentage contribution of economic activities to GDP by region, 2016 at constant prices: (base year 2004) (Source: PCBS, 2017)

Since increase in the value added of these activities was lower than an increase in the number of employed persons, the average value added per employed person in construction activities decrease by 5.9% in 2016 to reach USD 6,917.1. Conversely, the nominal average daily wage of waged employees in these activities grew to NIS 91.8. The rate of employed persons in construction is 12.1% at West Bank compared to 6.3% in Gaza Strip (Figure 2.2). The construction activities are a key item of fixed capital formation, which constitutes part of GDP and represents a basic element in the study of the structure and evolution of the Palestinian economy (PCBS, 2017).

This sector also employs about 30% of labors indirectly in industries related to the construction sector and other services and productive sectors (PCU, 2008). However, local construction industry suffered great losses in term of quality, cost, and delay in in handling projects due the policy of (Israeli occupation) closure of the crossing points (PCHR, 2010). There are many challenges affect local construction industry like lack of funding, the dependence on funding and implementation of aid from donor countries, weak infrastructure, lack of management, security issues related to political and economic instability in Palestine (Najmi, 2011). The main challenge is that Palestinian construction sector depends on (Israeli occupation) for energy, communications, raw materials and exports so the closure of border crossings imposed by Israel has left grave impacts on this sector (Enshassi & Ayyash, 2014).

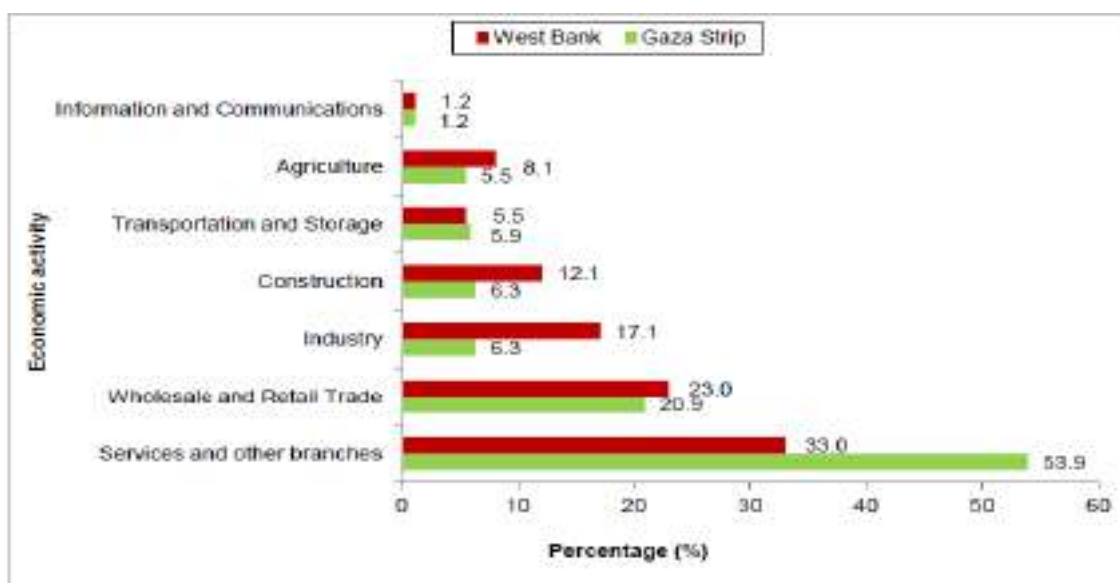


Figure (2.2) : Percentage distribution of employed persons by economic activity and region, 2016. (Source: PCBS, 2017)

Palestinian construction sector suffers from cost problems. Cost problems dealing with unforeseen costs is usually a problem for construction project parties and is the basic reason of the failure of many projects. Risks and uncertainty are the main causes of unforeseen costs in construction projects because these may cause cost overrun and losses for construction parties (Enshassi & Ayyash, 2014). Safety and quality are not widely recognized as inherent characteristic of success for Palestinian construction projects. The key players in the Palestinian construction industry do not adopt safe working practices for several reasons including that: employers and employees are unwilling to spend or invest in safety measures, equipment or practices; hazards are considered a necessary part and consequence of construction; employees cannot afford to purchase their own safety equipment (Enshassi, Al-Najjar, & Kumaraswamy, 2009).

Construction activities witnessed an increase in the number of employed persons in Palestine in 2016, it increased by 12.6% and the percent change in the number of employed persons in construction differed between the West Bank and Gaza Strip during the year 2016. As seen in Table (2.1), In Gaza Strip, the construction recorded the highest increase with 52.5% but in west bank is 5.2% (PCBS, 2017).

2.1.1 The Nature of the Construction Projects

The nature of construction industry can be divided by its features of output, its size, government as a main client, nature of demand for construction output, nature of construction work, variety of construction technology, and structure of industry and the construction projects require a high performance and skilled-based of worker because most of construction activities depends on the crew productivity (Faizal, 2010). Construction activity is extremely diverse, ranging from simple housing developments to highly complex infrastructure projects. However, all types of construction project, regardless of size, have some common characteristics which summarized by Loosemore et al. (2003) as the following :

- **Their tendency to be awarded at short notice:** Many construction projects are awarded following a period of competitive tendering, where possibilities for thorough planning are often limited. Having been awarded a contract, a design consultancy or contractor has to mobilize a project team comprising an appropriate

blend of skills and abilities to meet the project demands quickly. The resourcing function may need to respond to sudden changes in workload, as there can be no guarantee of how much work will be being undertaken at any particular time.

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Table (2.1) : Number of employed persons* by economic activity and region, 2011-2016. (Source: PCBS, 2017)

Economic Activity	2011	2012	2013	2014	2015	2016
Palestine						
Agriculture	93,000	91,100	84,100	85,400	73,200	62,100
Industry	69,300	96,200	101,100	107,800	115,900	115,500
Construction	69,900	74,800	77,800	71,900	77,200	86,900
Wholesale and retail trade	141,200	140,600	143,300	154,300	168,100	191,200
Transportation and storage	39,700	41,200	44,400	38,900	45,300	48,500
Information and communications	5,900	8,300	7,600	8,100	8,600	10,300
Services and other branches**	297,500	310,600	321,700	338,100	356,300	343,600
West Bank						
Agriculture	69,600	69,700	61,600	64,000	54,800	46,200
Industry	74,500	82,300	84,600	93,000	96,500	97,200
Construction	55,400	55,000	59,200	66,900	65,200	68,600
Wholesale and retail trade	99,000	98,900	96,000	110,400	117,300	130,600
Transportation and storage	22,100	21,400	24,400	25,200	27,800	31,400
Information and communications	4,800	6,500	6,400	6,500	6,500	6,900
Services and other branches**	167,500	174,700	181,800	191,100	200,800	187,900
Gaza Strip						
Agriculture	23,400	21,400	22,500	21,400	18,400	15,900
Industry	14,800	15,900	16,500	14,800	19,400	18,300
Construction	14,500	19,800	18,600	5,000	12,000	18,300
Wholesale and retail trade	42,200	41,700	47,300	43,900	50,800	60,600
Transportation and storage	17,600	19,800	20,000	13,700	17,500	17,100
Information and communications	1,100	1,800	2,200	2,600	3,100	3,400
Services and other branches**	130,000	135,900	139,900	147,000	155,500	155,700

* number of employed doesn't include the employees in Israel and settlements and abroad

** including government employees

- **Their unique, one-off nature and their reliance on a transient workforce:**

Unlike other sectors, where prototypes can be tested before real production gets underway, construction projects tend to be one-off, unique organizations that are designed and constructed to meet a particular client's product and service needs. This can lead to significant risks for people working on a project, which largely arise from learning-curve problems associated with new work activities and ever-changing workplace relationships. Construction projects are, for the most part, constructed in situ. Even with the increased use of offsite fabrication and the wider use of prefabricated components, the final product is normally assembled and completed in the required site location. This necessitates the employment of a transient workforce which can move from one project location to the next. This transience poses many problems for workers, such as longer working days, more expense in travelling to work and managing work-life balance issues, since their families may not be as mobile. Transience also arises within projects, since the composition of teams normally changes during different project stages, involving people from many organizations, backgrounds and location.

- **Increasingly demanding clients:** in recent years there has been a steady increase in the quality of service and product expected by clients procuring construction work. For example, in Australia it has been estimated that construction projects are being delivered in about half the time they were ten years ago. Inevitably, this requires a considerable commitment from those working in the industry, which tends to manifest itself in unsafe working practices, long working hours and increased levels of stress.

Dainty, Moore, and Murray (2007) stated another characteristic that the labor intensiveness of construction activity. The construction industry remains one of the most people-reliant industrial sectors; staffing costs represent the majority of costs on most projects. The industry employs an extremely diverse range of people from a wide range of occupational cultures and backgrounds, including people in unskilled, craft, managerial, professional and administrative positions, and these diverse groups of employees operate as an itinerant labor force, working in teams to complete short-term project objectives in a variety of workplace.

A male-dominated culture in construction work whereas construction is one of the most male dominated industries in virtually every developed society. Men dominate both craft trades and professional and managerial positions within the sector. This reliance on male employment leads to many challenges, such as skills shortages caused by recruiting from only a portion of the population, difficulties in the management of equal opportunities and workforce diversity, and considerable challenges in terms of creating an accommodating atmosphere in which individuals' diverse skills and competencies are fully utilized (Dainty et al., 2007).

These challenges require construction companies to balance project requirements with competing organizational and individual employee expectations, priorities and needs. It is the industry's inability to manage these competing demands effectively which has caused many of the enduring problems which plague the industry today.

2.1.2 The Challenges of Managing People in Construction

People are an organization's most valuable asset and this is especially true in relatively low-tech, labor-intensive industries such as construction. However, people also represent the most difficult resource for organizations to manage. Unlike physical assets, people have their own individual needs which must be met and idiosyncrasies which must be managed if they are to contribute to organizational growth and development. People are individuals who bring their own perspectives, values and attributes to organizational life, and, when managed effectively, these human traits can bring considerable benefits to organizations (Mullins, 2007).

However, when managed poorly they have the potential to severely limit organizational growth and threaten the viability of a business. There are countless examples of corporate and project crises in the construction sector which have arisen as the result of people's behavior, and it would seem that labor management has the potential to eliminate more construction risks than any other management approach (Loosemore, 2000).

Although a new advances in technology and production management systems, construction remains one of the most people-needful industrial sectors. Human resources represent the great majority of costs on most projects, and the industry employs an extremely varied range of people from a wide range of occupational

cultures and backgrounds, including people in unskilled, craft, managerial, professional and administrative positions. These diverse groups of employees operate as an itinerant labor force, working in teams to complete short-term project objectives in a variety of workplace settings. Hence the industry's project-based structure is made up of many dissimilar organizations which come together in pursuit of both shared project objectives and specific organizational objectives. These objectives are not necessarily compatible and they might not align with people's personal objectives, which can lead to competing demands on those working within project-based environments. These features make construction one of the most challenging environments in which to manage people effectively, to ensure that they contribute to organizational success (Loosemore et al., 2003).

2.2 Labor Management

2.2.1 Labor Definitions

Labor is defined as a task that requires the exertion of body and mind or both (Wachira, 2001). According to Annual Report for Labor Force Survey defines the labor (employed) is : Persons aged 15 years and over who were at work at least one hour during the reference period, or who were not at work during the reference period, but held a job or owned business from which they were temporarily absent (because of illness, vacation, temporarily stoppage, or any other reason) he\ she was employed, unpaid family member or other. The employed person is normally classified in one of two categories according to the number of weekly work hours, i.e. 1-14 work hours and 15 work hours and above. Also the absence due to sick leave, vacation, temporarily stoppage, or any other reason considered employed from 1-14 hours (PCBS, 2017).

PCBS (2017) classified Employed persons according to employment status as follows :

Employer: A person who work in an establishment that is totally or partially belonging to him\ her and hires or supervises the work of one or more wage employees. This includes persons operating their projects or contracting companies provided they employ a minimum of one wage employee. Shareholders are not considered employers even if they are working in it.

Self-employed: A person who work in an establishment that is totally or partially belonging to him/her (partner) and do not hires any wage employees. This includes self-employed who work to own selves outside establishments.

Paid- employed (wage employee): A person who works for a public or private employer or under its supervision and receives remuneration in wage, salary, commission, tips, piece rates or in kind ...etc. This item includes persons employed in governmental, non – governmental and private institutions along with those employed in a household enterprise in return for a specific remuneration.

Unpaid family member: A person who works without pay in an economic enterprise operated by a related person living in the same household.

2.2.2 Structure of Labor Force

The labor force can be broadly categorized into two. They are:

1. Skilled labor or craftsmen
2. Unskilled labor

The staffs under the skilled labor are of varying abilities ranging from apprentices to trades foremen or supervisors. The apprentice can be described as a beginner who is willing and interested in learning a certain trade in the construction industry (Fagbenle, Ogunde, & Owolabi, 2011). The three possible; avenues of training this category of people are the school, the workshop and the field (Husseini, 1991). Some of the craftsmen in this category are carpenters, joiners, masons/bricklayers, electricians, plumbers, mechanics, painters, plant operators, scaffolders, crane drivers, steel fixers, tile setters. The unskilled labor on the other hand is a category of workers that requires no special skill and it is defined as any way of making a living with little or no degree of security of income and employment. They require little or no training to make them perform They are able-bodied men and women that perform manual duties. Their major asset therefore lies in their strength with a healthy body (Fagbenle et al., 2011).

Labor are employed in the construction industry and work predominantly on construction sites and are typically engaged in aspects of the industry other than design or finance. The term includes general construction workers, also referred to as

laborers and members of specialist trades such electricians, carpenters and plumbers Construction is an industry that requires working at ever-changing locations and work environments. This profile refers to general construction workers. Others at a construction site include electricians, carpenters and plumbers. Some of the main duties of a general construction worker are to install various commercial, industrial or residential systems Ensure that projects conform to building codes and regulations. Use, clean and maintain various types of equipment. Supervise or apprentice other workers (Kumar, 2011).

The challenges of lack of skilled labor, heavy competition among firms, technological problems, low productivity and to mention but a few leads to a high rate of poor performance and poor product implementation while placing a serious limitation on product expansion and increase in productivity (Okoye & Ezejiofor, 2013). To reduce the managing risks and attain better flexibility, it has also made the management of projects more complex, with a requirement for highly skilled and experienced human resources managerial and developmental practices (Tabassi, Ramli, & Bakar, 2011). Furthermore it the quality of labor: where it is good or bad depends on several factors such as education and training, personal health, organization of labor work conditions, attitudes towards the work, relationship between the senior management and low level worker (Okoye & Ezejiofor, 2013).

Labor management Definition

Fryer (1982) define the Labor management is the process of channeling human energy and skills into achieving business objectives (Wachira, 2001). Labor management is thus concerned with both the efficiency and the effectiveness of the labor, how fast the job is done and also how useful the task is.

2.3 Labor Management Relation

Labor-management relations are one of the pillars the support the industry of a country or region. These relations are not just between workers and capitalists or managers; in fact, they directly influence the industry and whole economy. In modern society, labor management relations are often treated as relations that rule economic activities and social living (Ebisuno, 2013).

The term “labor relations,” also known as industrial relations, refers to the system in which employers, workers, their representatives, and, directly or indirectly, the government interact to set the ground rules for the governance of work relationships. Developing and maintaining respect between labor and management is an important, mutually beneficial process. As companies expand overseas, they must take a global approach to labor-management relations. There are labor and legal risks specific to each country, and these should be managed proactively (Asian Productivity Organization, 2014).

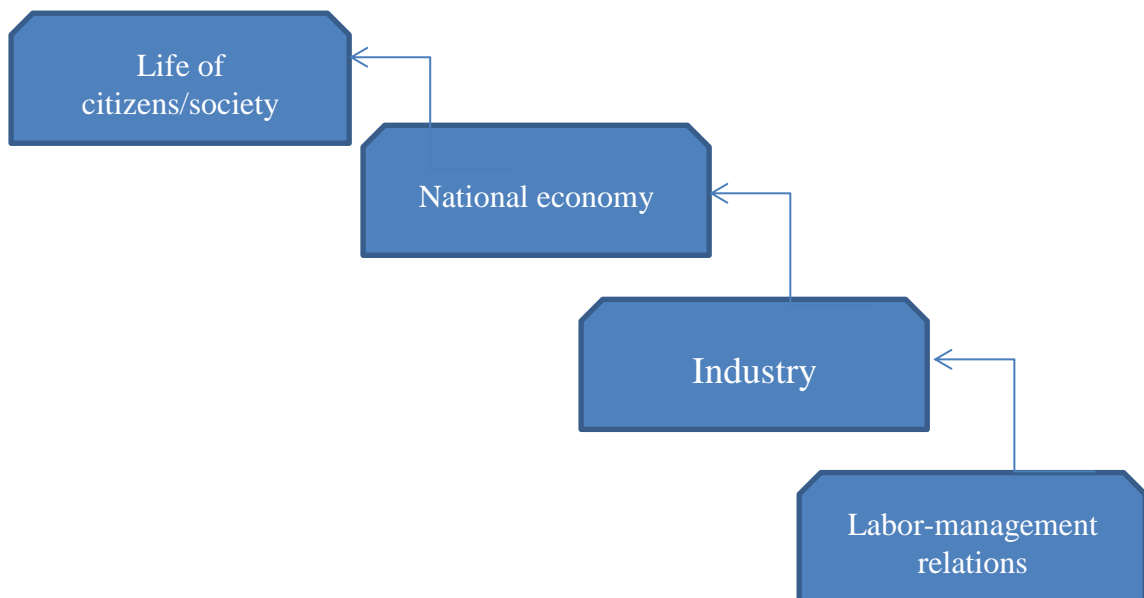
The study of labor-management relations (LMR) refers to the rules and policies which govern and organize employment, how these are established and implemented, and how they affect the needs and interests of employees and employers. LMR has implications for the organization of work as well as economic policy. Focus gradually has broadened from the formation and operation of national and local institutions and collective bargaining to strategic human resource policies. Most recently a multi-level agenda has formed, following new needs for regulation in world trade, in the extended European Union, and in former communist and newly industrialized countries." (Von Otter, 2007).

Dunlop (1958) who was the founder of the theoretical backbone that was used to construct the postwar style of Japanese labor-management relations, saw labor-management relations in a broad sense as not being limited to the relationship between the employer and the worker, but being "one of the frameworks for macro-analysis." Furthermore, Dunlop mentioned the necessity of an academic approach from not only the field of economics, but also from a variety of fields within the social sciences, such as sociology, management, jurisprudence, and political science. This is exactly what industrial relations are.

Labor relations are social relations formed in the labor process between the labor and the management. It includes rights relations and interests relations. Labor relations in labor disputes are both rights relations and interests relations. Labor relations include three categories, academic construction, resolve actual problems and ethics. Labor relations management and human resources management researches on problems at workplace in three perspectives of employer, employee

and the society, but they lay particular emphasis on different aspects. Be objective and neutral is the value starting point of labor relations management. Labor relations management should change from human resources management which aims at the maximum of interest of the management into strategic labor relations management which aims at the win-win of labor and the management and the sustainable development (Xiangquan & Kuang, 2011).

Mori (1981) also stated that labor-management relations are broad social relationships between the employer class and the worker class. In other words, labor-management relations are not limited to the relationships between workers and managers or capitalists; they broadly support the industry and economy, as well as the lives of people and the society that they live in Figure (2.3).



Figure(2.3): The impact of labor-management relations (Source: APO, 2014)

2.3.1 Characteristics and Features of Labor-Management Relations

Labor-management relations materialized along with the arrival of the construction sector in modern society. They are now one of the basic social relationships in in construction industry. The relations supported the industry and formed society. However, the relationship between labor and management in Palestine, as well as various countries and regions, have undergone long-term conflicts and disputes, and paid great sacrifices.

Asian Productivity Organization (2014) stated that employers and employees are different objects, with different principles and characters. Even though both are indispensable to each other, they have repeatedly been in conflict. Labor is necessary for corporate management, while labor is also necessary for workers to make a living by participating in production activities. Therefore, it was not rare to create a cooperative relationship between them for production activities. There were also complaints and problems regarding production sites, such as the work environments. Disputes regarding requested improvements and resolutions also often occurred. However, there were no serious conflicts on the fundamental production mechanism in which workers provided labor to make a living and corporations administrated businesses based on the provided labor. However, the difference between their principles became clear when it came to the way profits were distributed. As greater production was achieved, workers requested higher wages as a way to make a living. On the contrary, wages were a part of personnel expenses, which corporations had been trying to reduce as much as possible. It was a conflict of principles that naturally occurred to secure their existence. In addition, conflicts about the distribution of profits have caused various disputes such as strikes; production activities have also been significantly disturbed. This has also caused industrial stagnation and had a huge, negative impact on the overall economy. As a result, society became unstable and people's lives became chaotic (Asian Productivity Organization, 2014).

2.3.2 Labor Management System (LMS)

A labor management system (LMS) is comprised of enterprise tools that help companies better plan their daily work and processes for better delivery of products and services. These tools are intended to facilitate "labor productivity reporting" and to help analyze units of labor and units of time to enable tracking of changes. Some companies have greatly benefited from using these tools to identify productivity bottlenecks and eliminate them. The use of LMS may be one way for businesses to upgrade systems, to keep a competitive edge and to make business more efficient (Janssen & Janssen, 2017).

2.3.3 Labor-Management Partnership (LMP)

LMP is a type of normative concept, defined as an innovative approach to labor relations intended to improve labor-management relations and to confer benefits on both sides. It means that both labor and management make mutual efforts to stabilize industrial relations from conflict to cooperation and enhance the competitive advantages of their enterprises. Unlike labor relations models that exclude unions from management participation through union de-recognition, the partnership is seen as a labor relations model that creates positive roles for unions, as well as for individual workers, through management participation and claiming that the partnership can increase firms' performance, union renewal, employee participation, and mutual gains between employers and workers (Lee & Lee, 2009).

2.3.4 Labor Management Cooperation

In response to heightened levels of competition, many firms have been forced to restructure work practices and revise their labor-management relations. There has been a sustained effort to enhance work performance, develop more flexible employment arrangements, and reduce labor costs. The main potential benefits from cooperation management's perspective lie in improvements in productivity and quality. Through labor management cooperation, it is possible that production systems can be made more efficient, unnecessary overheads eliminated. Moreover, cooperative relationships may increase employee commitment to the organization and stimulate new ways of raising customer satisfaction, thereby enhancing loyalty and customer retention. Furthermore, a cooperative labor relations climate may lead to lower absenteeism and employee turnover (Deery & Iverson, 2005).

2.3.5 Labor Management Dispute

Labor management dispute is controversy between an employer and its employees regarding the terms (such as conditions of employment, fringe benefits, hours of work, tenure, wages) to be negotiated during collective bargaining, or the implementation of already agreed upon terms (BusinessDictionary, 2017). Disputes in general can be classified as individual or collective, depending on who initiates, or has the authority to initiate, the dispute. Generally, an individual dispute is one involving an individual worker and a collective dispute involves a group of workers,

usually represented by a trade union (Trebilcock, 2015). Labor-management disputes can affect in quality. Product quality is a product of skill, effort, and the firm's ability to monitor employee performance. Poorly motivated or disgruntled workers may reduce effort in ways that are difficult to monitor. Firms that continue to produce during strikes typically must rely on less skilled and less experienced replacement workers (L. Ding, Kleiner, Leonard, & Pilarsk, 2013) .

2.4 Factors Affecting the Performance of Labors

Construction industry faces challenges with regard to problems associated with productivity and the problems are usually associated with performance of labor. The performance of labor is affected by many factors and is usually linked to the performance of time, cost, and quality. Efforts to produce better performance and increasing productivity in construction requires an understanding of the various indicators of productivity as a path to understanding the performance of the project (Soekiman, Pribadi, Soemardi, & Wirahadikusumah, 2011).

Labor is the one resource that is most susceptible to improvement since material costs are generally fixed by consultants through specifications and profits are largely controlled by the competition. Any construction resource control and management must therefore emphasis labor. The primary responsibility of management in a construction firm, as in any other firm, is to ensure that all resources namely, manpower, machinery, materials and money are employed optimally to produce maximum profit for the investors in the enterprise (Fagbenle et al., 2011). The objective of this section is to identify the factors that are perceived to be affecting the performance of labor in the construction industry.

Parker, Lema, and Mlingwa (1987) identified three main factors that are affecting on site performance in construction as :

1. **Shortcomings in Labor Management** – these are factors that are within the control of the managers of the project. Labor management is the application of management skills to labor i.e. the planning, control, and monitoring of labor to ensure that it is focused on the achievement of the set objectives. Some of the shortcomings include unfair wages, lack of training, lack of motivation.

2. **Extraneous Reasons** – these are factors that are not within the strict control of the project team but which may be influenced by proper planning and scheduling of tasks e.g. inclement weather and breakdown of law and order
3. **Shortcoming of Labor** – these are factor within the control of the workers themselves but whose effect may be minimized by practice of sound labor management e.g. lateness, idleness, and careless workmanship

(Fagbenle et al., 2011) identified factors influencing labor performance and concluded that client's experience, form of building, labor force, form of building procurement and project organizational structure are elements of a complex casual factor of project time performance. He also identified managerial control, which he classed as project procedure, as a key element of achieving project success. Other influencing factors identified include traditional measures such as health, safety, material, size and scope of project .

The importance of manpower training and management to the construction industry was studied by Husseini (1991) and concluded that manpower enables the effective use of designed to achieve increase in performance, improvements in quality, achievement of lower unit cost, betterment of individual worker and cultivation of workers' motivation.

Also, Dada (2003) studied the perceptions on measures of contracting/contractors' performance by taking a case study of Lagos State indigenous contractors. His result indicated that there are no significant differences in the assessments and ratings of the identified measures of contractors performance (Dada, 2003).

The factors are summarized as follow :

1. Lack of training and retraining
2. Poor communication
3. Inclement weather
4. Unfair wages
5. Lack of motivation
6. Negative influencing factors
7. Design changes
8. Poor specification

9. Late information
10. Out of sequence work
11. Recruitment of unskilled labor
12. Lack of investment in research and development

Knowledge and understanding of the various factors affecting construction labor productivity is needed to determine the focus of the necessary steps in an effort to reduce project cost overrun and project completion delay, thereby increasing productivity and overall project performance (Attar, Gupta, & Desai, 2012)

Lill (2008) discussed that workforce has to be treated as the most valuable un-reproducible resource with vulnerable and hardly predictable behavior. From review research's reveal a number of factors which have combined to influence the construction skills shortfall. Some of these include:

- the introduction of new technologies which have reconstituted the skills required.
- the growth in self-employment and the use of labor-only sub-contractors which have reduced the commitment and investment in training within the industry. Self-employed craftsmen, in turn, are not able to handle their qualification improvement issues and there is a direct correlation between the fall of trainee numbers and the numbers of self-employed
- the poor image of the industry which unfavorably affects its popularity as a career choice. The image is low among workers themselves as the majority of construction crafts workers of various ages and experience would never recommend their trade to their children.
- high mobility of construction workers as the result of unattractive image, unsafe work place, irregularity of the workload, lack of respect and opportunities for training in addition to that the dissatisfaction with labor organization, especially the unstable workload has been mentioned as the reason of release by relieved workers.
- the site safety and quality of works are always the least and the last to be attended to, as they are always the conflicting goals running in different directions to earning and speed.
- a set of problems related with issues of women in construction deserve a special attention of researchers and globalization has added also negative ethnic

characterization and therefore consideration of cultural differences of multi-lingual construction teams is very important.

The combination of these factors has led to a labor market reliant upon a casual workforce, incorporating high levels of self-employment, low levels of training investment and hence, low quality skills. Ineffective management has been cited as a primary cause of low performance rather than other factors. Apart from that there are also some barriers to improve the productivity and these barriers are as follows: Lack of alignment of goal, Contractual conflict, Difficulties in measuring productivity, Weak commitment to continuous improvement, Lack of labor force focus (Attar et al., 2012).

2.4.1 Labor Productivity

Construction industry is depend on 3-M resources. The means of 3-M is manpower, machine and materials. 3-M are basic input in construction industry. Manpower is main and precious resource of construction industry. If we consider only manpower as an input in productivity, then productivity will be called construction labor productivity. Construction labor productivity is most frequently research topic for construction field researcher. A reason behind it because of labor cost are around 30-50% of total cost of project (Gupta & Kansal, 2014)

Productivity remains an intriguing subject and a dominant issue in the construction sector, promising cost savings and efficient usage of resources. Productivity is one of the most important issues in both developed and developing countries and improving productivity is a major concern for any profit-oriented organization (Enshassi, Mohamed, Mustafa, & Mayer, 2007).

2.4.1.1 Labor Productivity Definition

Productivity is a multidimensional term, the meaning of which can vary, depending on the context within which it is used .The term “productivity” expresses the relationship between outputs and inputs , and Labor is one of the basic requirements in the construction industry. Labor productivity usually relates manpower in terms of labor cost to the quantity of outputs produced (Gundecha, 2013).

Productivity can be defined in many ways. In construction, productivity is usually taken to mean labor productivity, that is, units of work placed or produced per man-hour. The inverse of labor productivity, man hours per unit (unit rate), is also commonly used. Productivity is the ratio of output to all or some of the resources used to produce that output. $\text{Productivity} = \text{Output} / \text{Labor cost}$. Output can be homogenous or heterogeneous. Resources comprise: labor, capital, energy, raw materials, etc. Productivity may then be defined as the ratio of earned to actual hours (Attar et al., 2012).

Yi and Chan (2013) indicated that The concise oxford dictionary defines ‘productivity’ as the power of being productive, efficiency and the rate at which goods are produced. Three distinct components of the concept of productivity are brought out by this definition:

1. Power of being productive is the force behind production itself;
2. Efficiency is a measure of how well the factors are utilized;
3. Rate is a measure of the output of the factors of production over a defined period of time .

Productivity is what man can accomplish with material, capital and technology Productivity is mainly an issue of personal manner. It is an attitude that we must continuously improve ourselves and the things around us . Productivity means how much and how well we produce from the resources used. If we produce more or better goods from the same resources, we increase productivity. Or if we produce the same goods from lesser resources, we also increase productivity. By “resources”, we mean all human and physical resources, i.e. the people who produce the goods or provide the services, and the assets with which the people can produce the goods or provide the services(Amanuel, 2016) .

2.4.1.2 Improving Labor Productivity

Productivity is one of the key components of every company’s success and competitiveness in the market. For projects located in the same construction area, labor, equipment's and materials costs are basically the same. One of the few opportunities to increase the bottom line of profitability is to increase productivity.

Increasing productivity benefits a contractor in several ways: The first is the Projects can be completed more quickly and Project cost can be lowered in addition to that the contractor can submit more competitive bids and The Project can be more profitable (Heizer & Render, 1990) .

Improving labor productivity at construction site is easy to pose as a strategy plan, but not so easy to achieve given the complexity of the construction process. To improve labor productivity at construction sites the construction company should be committed to improving productivity and reinforce that with implementing best practices for planning and implementing projects then it is possible to achieve improvement. As it is mentioned in previous studies, the different working cultures which results in improved labor productivity would include: Implementing best practices for quality engineering and effective planning of all phases, Lessons learned and continuous improvement across projects in addition to that supply chain management and materials management as well as right tools and equipment and effective collaborative team building and communications (Amanuel, 2016).

(Attar et al., 2012) identify a guideline for improving the labor productivity as follow :

1. Properly training to the laborers,
2. Motivation to workers towards project completion,
3. Properly and in advance material procurement and management,
4. On time payment to the workers,
5. Systematic flow of work,
6. Properly , clearly & in time supervision,
7. Advance site layout,
8. Maintain work discipline,
9. Facilities to the laborers,
10. Systematic planning of funds in advance,
11. Maximum use of machinery and automation system,
12. Advance equipment planning.

To achieve good productivity, labor plays a significant role. The following are the major causes for low productivity on construction projects those are related to labor.

There should be sufficiently skilled and experienced laborers on projects in order to make the projects productive. If laborers are unskilled and in lack of experience, they take longer time to complete specified task and there will be a possibility of rework, therefore incompetence of laborers can be considered as one of the possible causes for the decrease in productivity. Misunderstanding among laborers creates disagreements about responsibilities which leads to a lot of work mistakes resulting rework and consequently it decreases labor productivity (Amanuel, 2016).

2.4.2 Labors Training

Training has become one of the necessary functions in most organizations, as training leads to greater performance in the same field and is an important part of human resource department as it has a significant impact on the success of an organization through enhancing employee performance as well as, organizational performance (Jagero, Komba, & Mlingi, 2012). Training is considered to have a massive impact on organizational efficiency. It is also noticed that more expense in training has led to more productivity. Employees with effective training will possess better opportunities to acquire more new knowledge and skills, as well as competence. Therefore, they will be more able to perform tasks effectively and with better quality (Nassazi, 2013).

2.4.2.1 Training Definition

Training is the method or manner used to build abilities and enhance employee skills and knowledge by providing new information for them to perform their job efficiently (Jagero et al., 2012). According to Naqvi and Khan (2013) Training is considered as the process of improving the existing skills, knowledge, exposure, and abilities in an individual. Training is learning process that involves the acquisition of knowledge, sharpening of skills, concepts, and rules or changing of attitudes and behaviors to enhance the performance of employees (Hanif, 2013).

Training is an organized increase from the know - how skills and sensations needed for staff members to execute efficiently in the offered process, as well as, to operate in underling situation. Moreover, it also enhances the capabilities of panel of employees in very effective way by motivating them and transforming them in to well organize and well - mannered, that ultimately affects the

performance of organization. Training as an indicator to enhance superior skills, knowledge, capabilities and outlook of the employees that results in effective. Training could is defined as a set of activities which react to present needs and is focused on the instructor and contrasts with learning as a process that focuses on developing individual and organizational potential and building capabilities for the future (Mozael, 2015).

2.4.2.2 Benefits of Training

Employee training plays an important role in developing performance and achieving high level output thereby leading to increased company strength in the competitive marketplace (Nassazi, 2013). The major goal of labor training is to enhance and improve skills, attitudes and knowledge in order to developed performance and productivity.

Training programs are important to increase employee competencies, it also contributes to enhancing knowledge, skills and necessary information for future jobs thereby achieving desirable organizational performance and contributed to increased employee satisfaction and reduced absenteeism and turnover thereby increasing the feeling of comfort amongst employees leading to a sense of achievement for employees to develop their inherent abilities. Early planned training by trainers for trainees will help achieve desired benefits easily (Mozael, 2015). There are so many benefits associated with training. (Cole, 2002) summarizes these benefits as below:

- 1) High morale- labor who receive training have increased confidence and motivations;
- 2) Lower cost of production – training eliminates risks because trained personnel are able to make better and economic use of material and equipment thereby reducing and avoiding waste;
- 3) Lower turnover – training brings a sense of security at the workplace which in turn reduces labor turnover and absenteeism is avoided;
- 4) Change management – training helps to manage change by increasing the understanding and involvement of employees in the change process and also provides the skills and abilities needed to adjust to new situations;

- 5) Provide recognition, enhanced responsibility and the possibility of increased pay and promotion;
- 6) Help to improve the availability and quality of staff .

2.5 Approaches and Methods in Labor Management

In today's competitive market, labor represents one of the most significant risks to contractors. In other words, project risks cover uncertainties due to labor. Construction industries in many developed and developing countries suffer from delays and cost overruns due to poor labor productivity. Construction workers are not machines, always behaving the same way under the same conditions. Even under apparently identical work conditions, different productivity values might be obtained. That is, the productivity for the same work item is not constant throughout the construction period, and varies at different stages of the production. so, variability is shown to be a key factor in the behavior of construction labor productivity. Meanwhile, the effect of the management practice on productivity may vary from task to task. Although some practice could have similar influences on productivity of a number of tasks, their rate of impact on productivity may be different (Kazaz & Ulubeyli, 2006).

2.5.1 Labor Management Styles

Examines the fundamental changes that have taken place in China's labor management system since China embarked on its economic reforms in 1978. The system was, from the 1950 s onwards, characterized by what were called the 'three old irons', i.e. life-time employment (the 'iron rice bowl'), centrally administered wages (the 'iron wage'), and state-controlled appointment and promotion of managerial staff (the 'iron chair'). Replacing this with a human resource management model with three stage such as: (1) provide skill training and job placement services for young people waiting for job, (2) assignment and experiment of labor contract system, (3) unified labor law, (4) The revival of piece-rates and bonuses, (5) Linking wages to enterprise performance, (6) Moving toward full autonomy of enterprises over wages (D. Z. Ding & Warner, 2001).

The Japanese style of labor-management relations formed the basis of industrial society in postwar Japan, and had a great impact on the society, economy, labor, and lives of people in Japan. The Japanese style of labor-management relations was created by cooperative relationships between labor and management. This was done through mutual conflict and building solidarity across the organization. Corporations, workers, and the government shared the common goal of advancing the Japanese economy, as well as to stabilize and improve the lives of the Japanese people. To do so, a mechanism was created where both labor and management restrain themselves from pursuing their own short-term benefits, and instead put efforts into improving productivity. As a result, employment was created by corporation expansion, which led to an increase in wages. They moved away from an adversarial relationship, where labor and management fought for a larger slice of the pie, and went toward the development of a cooperative relationship that would lead to an expansion of the pie. In other words, for workers to protect their employment and increase wages to improve their lives, they were required to improve productivity so that corporations could achieve expansion and development. Corporations were also required to secure the employment of workers, who supported the corporations, as much as possible, while encouraging the development of abilities by promoting educational activities to cultivate talented employees. Therefore, corporations and workers shared the same fate. Within this system, the government promoted various kinds of policies and provided support for building this mechanism (APO, 2014).

According to a study by Gospel (1986) he discussed the Comparative Patterns of Labor-Management Relations: Great Britain, the US, and Japan markets influence employers' labor policies both directly and indirectly through corporate structures. Corporate structures also have their own direct effect on labor policies. The model thus seeks to explain labor relations using market and organizational explanations. There may be other factors at work, for example, cultural and political influences that help to shape labor relations. It is also clear that labor unions have an independent effect. However, the model initially emphasizes the preeminence of an economic explanation.

The analysis of recruitment strategies showed that differences exist among countries because diverse are the factors that affect company choices. Ultimately,

this has different consequences for the mobility of workers. We found that companies' decisions on recruitment of workers are guided by two main (interconnected) aims: coping with labor shortages and minimizing labor costs. To achieve these goals recruitment strategies seem to rely, on the one hand, on the labor costs differential existing between countries (Fellini, Ferro, & Fullin, 2007).

2.5.2 Labor Motivation

The human resource establishes the biggest challenge because unlike other inputs employee management calls for skillful handling of thoughts, feelings and emotions to secure highest productivity. Employee motivation delivers long-term benefits in the form of high productivity. A motivated employee is a valuable asset which delivers immense value to the organization in maintaining and strengthening its business and revenue growth.

2.5.2.1 Motivation Definition

The term of motivation is derived from the Latin language 'movere', and in the present context motivation is embodied in the psychological processes to ask for direction, give direction, and enhance the behavior to do something in order to achieve goals.

According to Marisa (2012) motivation can be defined as all the factors that cause people's behavior also motivation is having the encouragement to do something and it determines why, whether, and how people work.

Motivation can be defined as what causes people to act, the willingness of people to work in order to attain goals. Motivation efforts must be directed towards improving organization operations. To be effective, however they must also be designed to show benefits to the employee. In fact, motivation can best be accomplished when workers are able to merge their personal ambitions with those of the organization. So another definition of motivation is derived to be the willingness to exert high level of effort to reach organizational goals, conditioned by the effort's ability to satisfy some individual need (Al-Aamri, 2010). Logically that there is evidence supporting the existence of a linkage between an employee's motivational level and their individual performance.

A motivated employee is a loyal employee and to be loyal implies that the employee supports the actions and objectives of the firm. The appearance of the job as a whole has, in fact a bearing on the willingness and quality of an employee's performance.

2.5.2.2 Motivation Strategies to High Labor Performance

The relationship between motivation and performance is directly linked. Suitable motivation of labor can be hypothesized as a key contributor to maximizing workers' productivity. The motivation concept is generally defined as a composition of powers and mechanisms which help to direct human behavior in a desired manner, or with a more specific context it is described as the all convincing and encouraging actions which help workers fulfill their tasks willingly and to come closer to project objectives. Motivation of the labor force is of paramount importance because the quality of human performance at the workplace depends largely upon motivation. That is, higher motivation brings higher productivity. Even the smallest action that is positive or negative can have an effect on workers' attitude and motivation. The motivation, especially monetary rather than moral, has proven its influence on the productivity of workers (Kazaz, Manisali, & Ulubeyli, 2008).

According to study of Srivastava and Barmola (2012) he discussed the motivational strategies to encourage productivity and classify it as:

- 1) Promote Challenges and Accomplishments,
- 2) Utilize Group Incentives as Well as Individual Incentives,
- 3) Rethink Job Design,
- 4) Promote a Healthy Work Environment.

Contingent upon above suggestions, success requires a comprehensive strategy implemented thoughtfully. By working together, it can build a highly motivated and empowered team of talented, top performing professionals (Srivastava & Barmola, 2012).

2.5.2.3 Factors of Motivation

Chand (2014) discussed that there are several factors that motivate a person to work. The motivational factors can be broadly divided into two groups: monetary factors and non-monetary factors .

Monetary factors are extrinsic to work, such as the following:

- **Salaries or wages:**

Salaries or wages is one of the most important motivational factors. Reasonable salaries must be paid on time. While fixing salaries the organization must consider such as: Cost of living , Company ability to pay, Capability of company to pay etc.

- **Bonus:**

It refers to extra payment to employee over and above salary given as an incentive. The employees must be given adequate rate of bonus.

- **Incentives:**

The organization may also provide additional incentives such as medical allowance, educational allowance, hard duty allowance, house rent allowance. The company may provide special individual incentives. Such incentives are to be given to deserving employees for giving valuable suggestions.

Non-Monetary factor are rewards intrinsic to work, such as the following:

- **Status or job title:**

By providing a higher status or designations the employee must be motivated. Employees prefer and proud of higher designations.

- **Appreciation and recognition:**

Employees must be appreciated for their services. The praise should not come from immediate superior but also from higher authorities.

- **Delegation of authority:**

Delegation of authority motivates a subordinate to perform the tasks with dedication and commitment. When authority is delegated, the subordinate knows that his superior has placed faith and trust in him.

- **Working conditions :**

Provision for better working conditions such as air-conditioned rooms, proper plant layout, proper sanitation, equipment, machines etc, motivates the employees.

- **Job security:**

Guarantee of job security or lack of fear dismissal, etc can also be a good way to motivate the employees. Employees who are kept temporarily for a long time may be frustrated and may leave the organization.

- **Job enrichment:**

Job enrichment involves more challenging tasks and responsibilities. For instance an executive who is involved in preparing and presenting reports of performance, may also be asked to frame plans.

- **Workers participation:**

Inviting the employee to be a member of quality circle, or a committee, or some other form of employee participation can also motivate the work-force.

- **Cordial relations:**

Good and healthy relations must exist throughout the organization. This would definitely motivate the employees.

- **Good superiors:**

Subordinates want their superiors to be intelligent, experienced, matured, and having a good personality. In fact, the superior needs to have superior knowledge and skills than that of his subordinates. The very presence of superiors can motivate the subordinates.

2.5.3 Labor Monitoring

Construction labor monitoring presents opportunities and challenges. Practical experience highlights the importance of having documented policies and contracts. On construction projects, it is not uncommon for a human resource department to be in an urban center and workers at a remote site. Without written contracts and working terms, communication and transparency problems arise. Examples include workers being told they will receive a bonus for finishing work in a certain timeframe that is not reflected on payslips; national contracts that do not include international standard details such as holiday, accommodation and transportation benefits; timesheets not signed off by workers so the wrong hours are paid; and pay slips that are difficult for workers to understand (Rowan, 2013).

Corrective action can include changes to timekeeping sheets and payroll slips as well as more systematization in human resource (HR) records. For instance, one file per worker and inclusion of appropriate documents such as leave requests, qualification certificates, and next-of-kin details. Changes related to a company's administrative processes should be aimed at improving HR systems and hence treatment of workers rather than for bureaucratic or box ticking reasons. The trend to e-filing can help

systematization issues. Requiring contractors to report on the labor force profile (residence of origin, gender and age) as well as overtime use, toolbox talk topics, and labor grievance incidents is useful (Newitt, 2013). Monitoring experience has reinforced that labor profile reporting is important, especially to assess whether labor objectives are being met, for instance in relation to local content or gender equality. Construction labor monitoring helps produce the labor workforce profile at different points in the project schedule. Labor profiling is often required for sustainability reporting. Monitoring experience has identified overtime and accommodation facilities as key problem areas (Rowan, 2013).

Other issues that construction labor monitoring helps address but not detailed here are migrant labor socialization, security staff and property safeguarding, HIV/AIDs in the work place, passport retention, and occupational health and safety.

Value Added from Labor Monitoring

A main benefit of construction labor monitoring is it can be used to transfer and share obligations related to worker management, labor conditions, workers' rights, and workers' accommodation to subcontractors. Construction projects have regular health, safety and environment (HSE) meetings. While HSE Managers are comfortable with discussing OHS matters, they have rarely had to address other labor rights aspects or deal with a documented labor grievance mechanism .HR staff may be distant and although they see the paperwork, they often have little involvement with daily worker management or see the installation or maintenance of procured accommodation furnishings (Rowan, 2013).

Beginning with the project proponent and main contractor, awareness of labor rights and requirements needs to be built into the various tiers of contracting. To help with the learning process, it is useful to have the first construction labor monitoring visit in the first quarter of the construction phase. This means the emphasis can be on the main contractor and ensuring they have their systems in order, for instance their own HR procedures, a project labor grievance mechanism, a relationship with labor representatives, monitoring staff, and awareness of labor rights and project obligations. Key staff who need to know the project labor rights requirements are managers of OHS, HR, Compliance and Site Manager (Seo, 2011).

Encouraging the main contractor to provide guidance on key issues several subcontractors face has been effective to address third party direct workers. For a project, regulation topics were produced about equity and equal opportunity, labor grievance procedures, overtime use and termination/conclusion of contracts. Expanding the questions which focused on work and accommodation facilities to address workers' rights was recommended to act as an early warning system for delayed payment and other possible rights related breaches (Newitt, 2013).

2.6 Quality in Construction Projects

The management of quality in construction is an area of specialization that has been growing over the past three to four decades to embrace aspects of the project and company activities that are often seen as remote from the physical product. Figure (2.4) shows various concepts that are considered to have an influence on the quality of the product and which have come to be associated with quality in construction. The various areas that contribute to quality in construction reflect the product features, the processes of production and organization, as well as wider company and industry/ business issues. In particular, the management of quality in construction has been embracing considerations that address more of the pre-production processes and organization/industry issues. For example, a company's quality status is not just seen in isolation, but increasingly from the perspective of industry-wide standards and against that of its competitors (Harris & McCaffer, 2013).

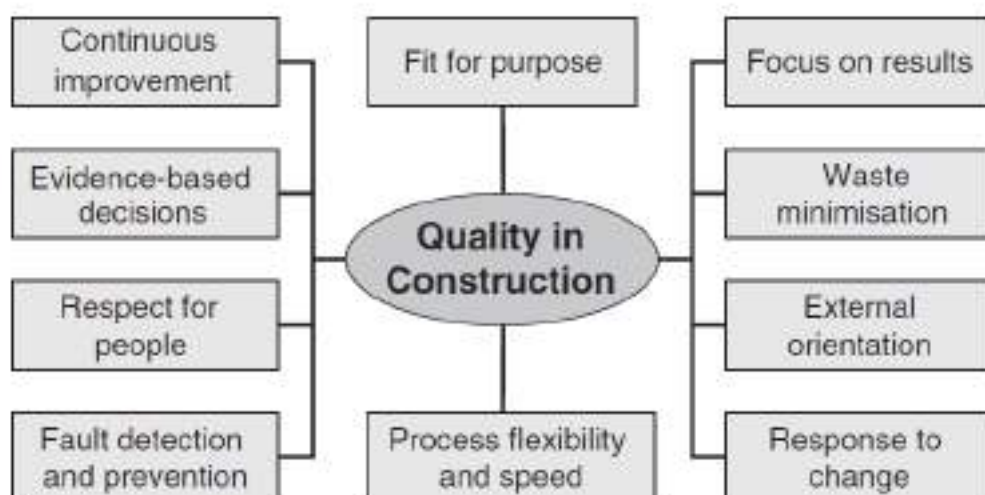


Figure (2.4): Aspects of construction quality (Source: Harris & McCaffer, 2013)

2.6.1 Quality Definition

Quality is a broad concept and defining quality can be difficult. There is no one universal definition of quality. The following definitions given by three most popular quality management gurus; Juran, Deming and Crosby respectively "quality is fitness to use" , quality is a " predictable degree of uniformity dependability at low cost and suited to the market " and quality is" conformance to requirement". Quality experts have different views in defining quality such as fitness for purpose, right first time, what the customer wants conformance to standard, value for money and right thing at the right time and others. Therefore, quality is fundamental to high-performing organizations and organizations should focus on the quality of goods or services. Moreover, the organizations should emphasize the quality concept in the management practices of the organization (Janipha & Ismail, 2013).

(Ashokkumar, 2014) identify terminologies which place a major role in quality management as follow :

Quality management: Quality management refers to all activities of overall management functions, especially top management leadership, that determine quality policy objectives and responsibilities for all members of the organization.

Quality planning: Quality Planning is identifying which quality standards are relevant to the project and determining how to satisfy quality standards.

Quality system: Quality systems refer to the organizational structure, process, resource and procedure needed to implement quality management.

Quality assurance: Quality assurance is the planned and systematic activities implemented within quality system and demonstrated, as needed, to provide adequate confidence that an entity will fulfil requirements for quality.

Quality control: Quality Control is the monitoring of specific project results to determine if they comply with the relevant quality standards and identifying ways to eliminate causes of unsatisfactory performance and ISO define quality control as the operational technique .

Total Quality Management (TQM) Total quality management is the management approach of an organization, which concentrates on quality based on the participation

of its members and aims at long-term success through satisfaction and benefits to all members of the organization and society.

The definition of quality for construction projects is different from that of manufacturing or services industries as the product is not repetitive but a unique piece of work with specific requirements. Quality in construction projects is not only the quality of product and equipment used in the construction of a facility but the total management approach to complete the facility. The quality of construction depends mainly upon the control of construction, which is the primary responsibility of the contractor” (Rumane, 2016).

Quality of construction work is dependent to a large extent on the attitudes of the contractors. Hence, the quality of the products is adversely affected if the parties to the contract do not carry out their duties properly. It is very importance to have a good coordination flow and improved teamwork to achieve the project quality objectives (Janipha & Ismail, 2013).

2.6.2 Factors Affecting Project Quality

Various attempts have been made by different researchers to determine critical success factors in construction. The literature abounds with lists of variables supposedly influencing the quality of a building construction project. There are some variables common to more than one list, but there is certainly no general agreement on the variables. Review of this previous research variables reveals some common threads of variables affecting the quality of a building project.

Chan and Tam (2000) stated that the generally perceived factors that influence quality performance can be grouped under the headings of client, project environment, project team leaders, project procedures and project management procedures which explained as:

The project characteristics have a significant role to play in affecting quality performance. That can be best defined in terms of project scope, nature of project and complexity of project. Project scope refers to the type of project, the number of stories and the sophistication of the project. Nature of the project defines whether it is a new works project or a refurbishment project.

The project environment, Environment can be considered as all external influences on the construction process. Broadly, these may be grouped as physical, economic, socio-political, and industrial relations, and they act at national or local level, and in different ways in the public and private sectors.

Project team leaders, The project team in the construction industry is that group of construction professionals and personnel from one or more organizations who combine to fulfil the necessary design, detailing and construction functions comprising the construction projects. The management of construction projects involves many diverse groups, client, designers, suppliers, sub-contractors, and the construction management team and client consultants responsible for advising on progress in terms of time, cost and quality. The performance of the team depends to a large extent on the skills and experience of several key project team leaders: the client representative, the design team leader, and the construction team leader. The performance of the project team members can be assessed by their technical and managerial skills, working relationship and attitude, and support from their parent companies.

Project procedure, Quality performance has been considered as a function of the procedures adopted during the construction process. Those procedures comprise the concept of procurement form and the method of tendering. The fragmental nature of the construction industry, the fact that no two construction projects are identical and the resulting ephemeral nature of the project organization places great dependence on the project team in setting up the construction process and bringing the project to a successful conclusion.

Project management actions, The managerial system is primarily concerned with decision making for planning and controlling organizational endeavor. The managerial subsystem can be seen as spanning the entire organization by relating the organization to the environment, setting the goals, developing comprehensive strategic and operational plans, designing the structure and establishing control process. An integral element of the managerial task is organizational decision making, choosing an overall strategy, setting specific objectives, designing structures and processes, selecting people, delegating responsibility, evaluating results and

initiating changes. The degree of project management actions can be reflected in the range and type of control mechanisms set up for particular problem (Chan & Tam, 2000).

2.6.3 The Effect of Labor Management on Projects Quality

Increasing the amount of labor in operating contexts has been associated with increasing both service quality (SQ) and conformance quality (CQ). Increasing the amount of labor, and thus reducing the workload per employee, also reduces the likelihood that employees would make errors or cut corners in performing their tasks. Also that becoming lean, in terms of decreasing labor levels, has the hidden cost of reduced SQ. In a non-service context, increasing employee workload can result in errors leading to quality problems. All these studies point to a positive relationship between labor levels and quality, but also suggests that the relationship between quality and profitability will depend on the context (Ton, 2009).

The results of data analysis indicate that there is a positive linear relationship between TQM (and each element of TQM) and labor productivity. This relationship has a high positive slope in companies with ISO 9000 certification, whereas it has a low positive slope in companies without ISO 9000 certification. The findings also indicate that there is no relationship between relative capital stock and labor productivity. This means that the changes in labor productivity were related to the changes in the degree of application of TQM philosophy and practices rather than the changes in relative capital stock. Therefore, the implementation of TQM principles is positively associated with labor productivity (Chapman & Al-Khawaldeh, 2002).

The relationship between interclass pay equity and product quality is examined in a sample of 102 corporate business units. A small pay differential between lower-level employees and upper-echelon managers (after controlling for inputs) is theorized to lead to high product quality by increasing lower-level employees' commitment to top-management goals, effort, and cooperation. Interclass pay equity is determined by comparing the pay and inputs of hourly workers and of lower-level managers and professionals to those of the top three levels of managers. Consistent with the predictions of distributive justice theory, both measures of pay equity are positively related to business-unit product quality (Cowherd & Levine, 1992).

It is not only the prescriptive literature which tends to ignore industrial relations considerations in the implementation of TQM. quality managers and managing directors did not consider it important to establish union agreement or a "positive working climate" before implementing a TQM programs. Chief executive commitment and drive, the agreement of the board and of middle management, and the establishment of a clear business mission and customer policy were all seen as being more important. In many organizations TQM programs are initially received with some enthusiasm by the workforce, but that this soon wanes and disillusionment sets in. He claims that this is due to management's preoccupation with the "hard", measurable aspects of the programs, such as costs and production performance, and the relative neglect of the "soft" aspects, such as customer perception and employee commitment. Managements are said to give insufficient attention to examining the underlying values and behavior of employees, with the result that there is a failure to achieve the "culture change" which is necessary if TQM is to be successfully implemented (Wilkinson, Allen, & Snape, 1991).

TQM might be seen as an attempt by management to control employees through internal discipline and self-control. However, the workforce appeared to be reasonably enthusiastic about the TQM program, They were able to solve problems directly, not only improving quality and developing greater pride in the work done, but also minimizing frustrations and disruptions. Thus, as a form of involvement, TQM may appear to offer immediate, tangible benefits to employees in a way that traditional forms of participation (Wilkinson et al., 1991).

The project quality is the key to success and the quality level of a project reflects the level of technology and management. The quality is divided into decision making, survey, design, construction, acceptance and use of process (Jiang, 2010). Moreover, the quality should also consider the entrepreneurs and social responsibility so as to keep competitive advantage. It is very importance to have a good coordination flow and improved teamwork to achieve the project quality objectives. A quality system will not succeed unless the construction organizations improve their quality continuously in terms of products and services. Through this they are able to compete aggressively in an environment where the quality requirement is always rising (Janipha & Ismail, 2013).

Chapter (3)

Methodology

Chapter 3

Research Methodology

This chapter discusses the methodology which was used in this research. The research methodology was chosen to satisfy the research aim and objectives which help to accomplish this research study. This chapter included information about the research strategy, population, sample size, data collection technique, questionnaire design and development, face validity of the questionnaire, pre-test the questionnaire, pilot study, final content of the questionnaire, and analytical methods of data.

3.1 Research Aim and Objectives

As mentioned in chapter 1 this research aimed to provide guidelines for effective labor management methods that enhance projects quality in contracting companies in Gaza strip. In achieving this aim, four objectives have been outlined as follows:

To assess the current situation of labor management in contracting companies.

To study the factors affecting the performance of labors and relationship with project quality.

To Identify the barriers face labor management in contracting companies.

To identify the most effective methods of managing labors to achieve good quality.

3.2 Research Strategy

The research strategy is the general plan for how and what data should be collected and how the results should be analyzed. The chosen research plan will influence the type and the quality of the collected data (Ghauri & Grønhaug, 2005). Research strategy can be defined as the way in which the research objectives can be questioned. There are two major type of research strategies, namely, quantitative research and qualitative research (Naoum, 2012).

Quantitative approaches tend to relate to positivism and seek to gather factual data, to study relationships between facts and how such facts and relationships accord with theories and the findings of any research executed previously (Fellows & Liu, 2015). Qualitative research methods seeks to gain insights and to understand people's perceptions, or opinion towards a particular object and the world whether as

individuals or groups. As well, it is used when a limited amount of knowledge about the topic are available. In addition to that qualitative research is "subjective" in nature. It emphasizes meanings, experiences, description (Naoum, 2012).

In order to investigate the research questions and hypotheses about labor management and their effect of project quality, This study adopted quantitative and qualitative data. The research technique was chosen as a questionnaire and case study to measure objectives.

3.3 Rationale of Use Research Method

The related fieldwork data to this research were collected by using two approaches. The first approach was the survey approach by using a structured questionnaire survey which was considered the most widely used data collection technique for conducting surveys since most of the literature mentioned studies using questionnaire which mostly suited to surveys whose purpose and objectives are clear enough to be explained in a few paragraphs which are carefully chosen and guaranteed in this research. Moreover it offers relatively high validity of results and a quick method of conducting the survey. Therefore the researcher adopted this strategy.

The second approach was the case study approach which will enable the researcher to study some of existing projects to enforce the questionnaire result with the real world, and gather more in-depth insights on participant attitudes, thoughts, and actions.

3.4 Research Design

At general, research design directs the research strategy by defining and improvement of a plan of scientific investigation that will guide the collection and analysis of data. In order to examination the research questions, a quantitative survey approach involving (company's manager, projects manager and site engineer) related to contracting company in Gaza Strip. The research technique was chosen as a questionnaire and case study to measure objectives.

In this research and for study the impact of labor management by contractors in projects quality, The following steps are followed as illustrated below:

1) Problem identification and definition of aim and objectives of the research in addition to developing the research plan.

2) Reviewing literature, during this phase, the literature related to the thesis topic was reviewed which would support the thesis questions and hypothesis and strengthen the structure of questionnaire. Reviewing literature on labor management and linked studies that are talking about factors affecting on labor performance, barriers face labor management, method and practice in labor management and quality in construction projects which lead to a summary about the comprehensive literature review to support the survey methodology .

3) Building and drafting the questionnaire of the research with the benefit of information gained from literature review .

4) Conducting pilot study by offering five copies of the questionnaire to experts, engineers, whom are working in the construction industry. They have academic background in questionnaires assessment to insure that the questionnaire questions are understood clearly and doing a pretesting , that help to achieve the aim of the questionnaire before distributing it. The questionnaire was modified based on the results of the pilot study and then the final questionnaire was distributed on the research target group.

5) Questionnaire distribution and data collection. The questionnaire was distributed to the research target group. Respondents were received and data analysis using statistical software Statistical Package for the Social Sciences (SPSS) to fulfill the required analysis then discussion of the results.

6) Case study: After quantitative research was conducted, a case study for some existing projects was implemented to enforce the questionnaire result with the real world.

7) Finally, included the conclusion and recommendation.

Figure (3.1) show the methodology flowchart used to achieve the research objectives:

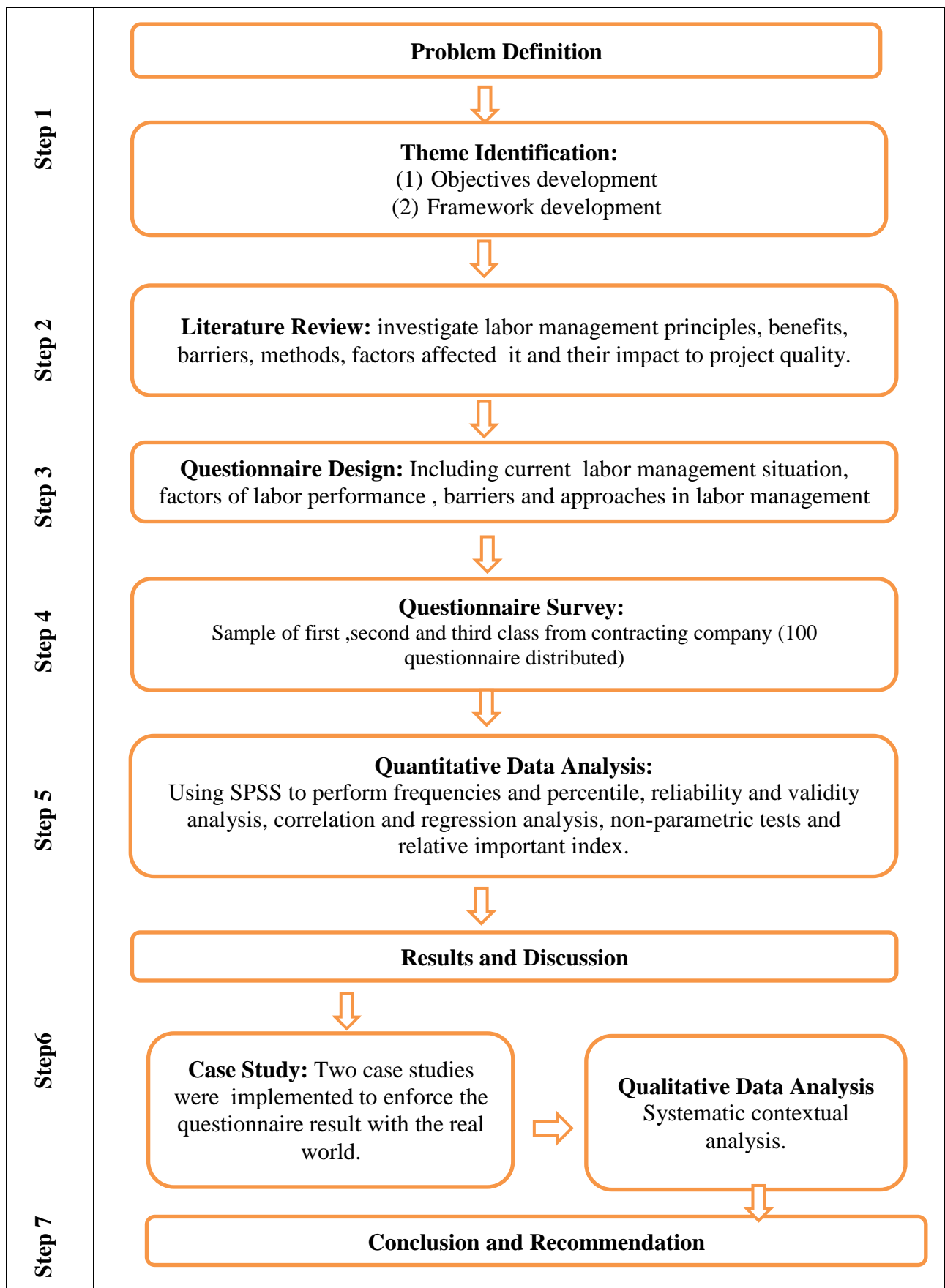


Figure (3.1): Framework of the research methodology

3.5 Research Period & Location

The study started at the beginning of June 2017 after the proposal was approved. The literature review was completed at the end of August 2017. The validity test, pilot study, questionnaire distribution and collection were completed at the end of October 2017. The analysis, discussion, conclusions and recommendations were completed in the end of December 2017. The research was carried out in Gaza Strip, which consists of five governorates: The northern governorate, Gaza governorate, the middle governorate, Khanyounus governorate and Rafah governorate.

3.6 Research Population and Sample Size

Research population refers to the entire group of people, events or things of interest that the researcher wishes to investigate in a study. It is the set of units that the sample is meant to represent (Sekaran & Bougie, 2016).

3.6.1 Research Population

The targeted population includes the contracting companies in the construction industry. The contracting companies classified according to the Palestinian Contractors Union (PCU) into five major categories depending on their sizes, capitals, executed projects, equipment values, and qualifications of the technical staff, The first class is the best class where fifth class is the last class. For the purpose of this study the population consisted of all construction contracting companies from the first three classes which working in Gaza Strip and have valid registration till the end of July 2017 according to the Palestinian Contractors Union (PCU) records. Table (3.1) below lists the number and percentages of valid contracting companies from the considered classes which form the population of this research:

Table (3.1): lists of the number and percentages of valid contracting companies.

Class	First class	Second class	Third class	Total
Registered.no	63	83	44	190
Percentage	33%	44%	23 %	100%

The decision to limit the scope of the study only to these three classes has been taken for following main reasons:

- 1) Contracting companies from these three classes have better organizational, human, labor and financial capabilities than contractors at lower levels, hence, they have different methods and approach's in labor management.
- 2) Contracting companies from these three classes are usually undertake most of the large projects given to local contractors; hence, it is consider a realistic sample and its impact of any improvement of quality achieved, will significantly contribute to the overall improvement of the local construction projects performance.
- 3) Generally there is a significant gap between those contractors and the lower classes contractors in terms of capacity and management capabilities; thus it was thought that this will create difficulty in generalizing the research result.
- 4) Lower classes contractors were excluded from the study specifically because they are very few in number - when this research was conducted- also have little number of worker and does not have a fixed project management.

3.6.2 Sample Size

Sampling refers to the statistical process of selecting and studying a representative few selected units instead of the large population to draw statistically valid inferences about the characteristics of the entire population. The principles of statistical sampling which guarantee a representative sample are employed for economy and speed (Fellows & Liu, 2015). It is extremely rarely possible to conduct full population surveys so that, a sample can be chosen from the study population that is commonly referred to as the 'target population' (Malhotra, 2007).

A statistical calculation approach have been used in this study to calculate the required sample size. The following formula was used to determine the sample size of unlimited population (Creative research system, 2014).

$$SS = \frac{Z^2 \times P \times (1-P) C^2}{C^2} \quad (\text{Equation 3.1})$$

The variables included in this formula can be described as follows:

SS = Sample Size which Refers to the number of respondents to be included in the study. In this study, it represents the number of the contracting companies to be surveyed by selecting one individual (projects manager or site engineer) from each company to fill the questionnaire.

Z = Z Value known as Z statistic for a level of confidence and equals to 1.96 for 95% confidence level (i.e. significance level of $\alpha = 0.05$). As with most other research, a conventional confidence level of 95% was assumed in this research (Creative Research Systems, 2014).

P = Percentage picking a choice, expressed as decimal, (0.50 used for sample size needed).

C = Confidence interval (0.08) since the general rule relative to acceptable margins of error (a precision) in categorical data research is 5%, However, its value can be increased when a higher margin of error is acceptable or may decreased when a higher degree of precision is needed. According to the need to find balance between the level of precision, resources available and the value used in other similar researches, a confidence interval (C) of 8% was assumed for this study to calculate the sample size. To justify this assumption Naing, Winn, and Rusli (2006) supposed that a larger margin of error (e.g. >10%) can be used if there is a resource limitation, and the population size is small (lower than 500). In this study, the targeted population is 190 which is less than 500 as described previously. On other hand, since the target group in this study are the project managers and site engineers, the possibility to access them need greater access time and effort because they are very busy and the difficulty to arrive to them to fill the questionnaire, which means getting less than accurate results. In addition, (De Vaus, 2013) concluded that, if the sample are broken up into a number of relatively small groups the sampling error (and thus the confidence interval) for those groups will be relatively high. In this study, the population grouped under three groups (firsts, second and third classes of contracting companies) and the sample was selected by stratified random sampling method as will described latter.

On the basis of the mentioned reasons, sample size for this study can be calculated as follow :

$$SS = \frac{1.96^2 \times 0.5 \times (1 - 0.5)}{0.08^2} = 150$$

The above sample size formula is valid if the calculated sample size is smaller than or equal to 5% of the population size ($n/N \leq 0.05$). If this proportion is larger than 5% ($n/N > 0.05$), we need to use the formula with finite population correction (Naing et al., 2006), using the following formula:

$$\text{New SS} = \frac{SS}{1 + \frac{SS-1}{pop}} \quad (\text{Equation 3.2})$$

Where;

New SS = Corrected sample size.

pop = Population size "190".

In this study, the population was 190, and the ratio between the obtained sample size and the population equals to 0.79 (150/190) which is larger than 0.05, then corrected sample size for finite population can be calculated as follows:

$$\text{New SS} = \frac{150}{1 + \frac{150-1}{190}} = 84 \quad (\text{Equation 3.3})$$

De Vaus (2013) proposed to use sample size that is 20 % larger than the expected end up sample. Thus, the number of distributed questionnaires can be substantially larger than the number required for a desired level of confidence and precision. So that, in this study, 100 questionnaires to be distributed to construction contracting companies working in Gaza Strip.

Table (3.2) describes the sampling numbers and percentages used in this study. The number of the returned questionnaires and the valid questionnaires number and percent are presented in this table .

3.6.3 Sampling Element

Sampling element usually represents the respondent in survey research and refers to the object about which or from which the information is desired and about which inferences are to be made (Malhotra, 2007).

In this context, experienced projects managers and site engineers working for the contracting companies in Gaza Strip were chosen as the sampling element (respondents), as they are responsible for decision making regarding corporate and project objectives. The main reason to survey these groups from contracting organizations was to get the realistic picture about efforts done in order to have high quality from labor management practices within the construction projects. In addition, these staff were targeted because they fell into the category of respondents that could give reliable information based on the purpose of this study. Projects managers and site engineers refer to individuals who are experienced in the managerial and construction activities and with highest authority to handle day-to-day activities with the aim of delivering the project also accountable for a managing labor aimed at providing an efficient environment and a good performance.

The perceptions of projects managers and site engineers can help other interested stakeholders to have a clearer understanding of what constitutes company success in the direction of the studied subject. Therefore, their role in the whole process is quite crucial and it was important to survey to capture their perceptions.

Table (3.2) : Sampling description and distribution

class	Population	Class proportion to population	Distributed questionnaire	Returned questionnaire	Valid respondent	Proportion of valid respondent
First class	63	33%	50	47	47	94%
Second class	83	44%	30	26	26	86%
Third class	44	23%	20	15	15	75%
Total	190	100%	100	88	88	88%

3.7 Questionnaire Design and Development

There are three fundamental stages were taken for constructing the questionnaire:

- 1) Identifying the first thought questions.
- 2) Formulating the final questionnaire.
- 3) Wording of questions.

Identification of items for the study and preparation of questionnaire was a crucial step for the success of the research. After a long time of searching, consulting, modifying and reviewing by the supervisor and experts the questionnaire was established and ready for distribution. The questionnaire consisted of close-ended (multiple choice) questions. Close-ended questions are more difficult to design than open-ended questions, but they come up with much more efficient data collection, processing and analysis (Bourque, 2003).

Bourque (2003) said that “*surveyors should avoid using open-ended questions in mail and other self-administered questionnaires*”. The questionnaire was designed in both English and Arabic languages in order to facilitate the understanding of content for the concerned population sample (refer to Appendix A and Appendix B for the final questionnaire design in English and Arabic respectively). The first page in the questionnaire was a covering letter that explained the study purpose, aim and the information security.

3.7.1 Contents of Questionnaire

Section 1: Consists of the general characteristics company and general information about person who filling questionnaire.

Section 2: Local labor management situation in contracting company.

Section 3: Factors affecting of labor management that leading to achieving quality in contracting companies.

Section 4: Factors that barring implementation of labor management in contracting companies in the Gaza Strip.

Section 5: Best activities to have a good project quality during efficiently method in labor management.

3.7.2 Data Measurement

This study survey questionnaire aimed to collect quantifiable data. This required the adoption of an appropriate rating scale to measure attitude responses. Likert scale is the most widely used rating scale to measure attitudes which involves providing a statement that reflects a particular attitude or opinion. Respondents indicate their level of agreement or disagreement on a predefined number of scale points for carefully constructed statements (De Vaus, 2013). Likert scale has several advantages. In general, it is simple and easy to construct and administer, and respondents readily understand how to use the scale, making it suitable for Internet surveys, mail, telephone or personal interviews (Malhotra, 2007). This scale is more reliable and its reliability can be assessed by easy methods (De Vaus, 2013). On the other side Likert scale takes longer to complete than other itemized rating scales because respondents have to read and fully reflect upon each statement (Malhotra, 2007). With reference to its benefits, a five-point Likert scale was used in this study questionnaire to give some degree of flexibility of choice to reflect the intensity of respondent views, so that, the respondents asked to rate the each statement included in the questionnaire .

In summary, Table (3.3) provides a description of the Likert scale points used in the this study questionnaire, which have been arranged in ascending order to measure the strength respondents' attitude. The respondents were required to answer the questions according to actual situations that they had experienced in their companies and on projects they were working on or had recently completed.

First draft of the questionnaire was revised through three main stages, which are: face validity, pre-testing the questionnaire, and pilot study. With each stage, the questionnaire was revised and refined more and more. Regarding details of each stage, it will be discussed in the following part.

Table (3.3): Likert measurement scale adapted in the questionnaire

No	Section Title	Measurement Scale				
		1	2	3	4	5
1	Respondent and company general information	Nominal scale				
2	Local labor management situation in contracting company	Strongly disagree	Disagree	Don't know	Agree	Strongly agree
3	Factors affecting of labor management that leading to achieving quality in contracting companies	Ineffective	Low effective	Moderate effective	High effective	Very high effective
4	Factors that barring implementation of labor management in contracting companies in the Gaza Strip	Not a barrier	Somewhat of a barrier	Moderate barrier	Important barrier	Extremely important barrier
5	Best activities to have a good project quality during efficiently method in labor management	Low degree effect	Something effect	Moderately effect	Significantly affect	Very Significantly effect

3.8 Face Validity

Face validity was important to see whether the questionnaire appears to be a valid or not. By testing the questionnaire validity, we can indicate whether the research is believable and true as high validity typically producing more accurate and meaningful results (Zohrabi, 2013). In this research, the content validity of the proposed questionnaire was satisfied, since the development of the scale of measurement items was mainly based on an extensive review of the literature and detailed evaluations by several industry experts, professionals and academics .

The questionnaire was consulted by five experts who have more than 10 years' experience in construction projects and they have academic background in questionnaires assessment to review the questionnaire and make adjustments that best fit the Palestinian conditions. Table (3.4) showed some detailed information about the experts work and their experience in construction projects and their notes for modification. Each expert got a copy of the questionnaire for revision, and after that the researcher discussed the notes with each expert. Some notes were confirmed by more than one expert. Each note were carefully considered in preparing the final questionnaire.

Table (3. 4): Results of the face validity

No.	Recent work	experience	Note
Expert A	Associated Professor in civil engineering. IUG	25 Years of experience	<ul style="list-style-type: none"> • Suggest to specify the option" other" in the first question in part 1. • Suggest to delete question number 10 in part 1. • Suggest to use five scale in the part of company information. • Modified an items in the part of labor management barriers (in English language) to facilitate understanding.
Expert B	General manager of projects department. UNRWA	20 Years of experience	<ul style="list-style-type: none"> • Add option field engineer and site engineer in question number 1 in part 1. • Suggest to begin from low to high level in part 2. • Add choice electric and mechanic in question 6 in part1.
Expert C	Head of projects unit in UNDP	22 Years of experience	<ul style="list-style-type: none"> • Add sentence " you can choose more than option in question 6 at part 1. • Suggest to use the same scale in part 1. • Delete the question number 15 in part 5 because it repeated. • Helping in designing for measuring objective #1 which was about assessing the current situation of labor management .
Expert D	Site engineer have MSc in construction management	11 Years of experience	<ul style="list-style-type: none"> • Delete question 6 in part 3 at factors related to project nature. • Advice to add more factors which related to project nature. • Formulate question 5 in part 2 to be " Do not distribute workers well in the workplace" .
Expert E	MSc of statistics	15 Years of experience	<ul style="list-style-type: none"> • Change the scale in question 9 in part 1 and make choice 20-30 and more than 30. • Standardize the formulation of the questionnaire questions either in negation or in the affirmative.

3.9 Pretesting the Questionnaire

Pre-testing the questionnaire was done to make sure that the questionnaire is going to deliver the right data and to ensure the quality of the collected data. In other words, pretesting the questionnaire was important and necessary step to find out if the survey has any logic problems, if the questions are too hard to understand, if the wording of the questions is ambiguous, or if it has any response bias (Lavrakas, 2008). The questionnaire was conducted to limited group from the targeted population. Hertzog (2008) Identify using 10% of the sample in pretesting stage will be adequate so that the pretesting was conducted in two phases and each phase has been tested with five professional project manager having a wide experience in the field of construction industry in Gaza strip and having adept acquaintance and knowledge about labor management practices in the construction projects.

The first phase of the pre-testing resulted with some modifications to the wording of some words in the questions, in addition to add further explanation to some items to simplify the understanding of the question. The questionnaire was amended based on the results of the first phase of the pre-testing. After that, the second phase was conducted and it was sufficient to ensure success of the questionnaire, where there were no any queries from any professional and everything was clear. According to that, questions have become clear to be answered in a way that helps to achieve the target of the study and to start the phase of the pilot study. For further details review Table (3.5).

3.10 Pilot Study

After the success of the phase of the pretesting of the questionnaire. A pilot study for the questionnaire was conducted before collecting the results of the sample. It provides a trial run for the questionnaire, Malhotra (2007) defined pilot testing as "testing the questionnaire on a small sample of respondents for the purpose of improving the questionnaire by identifying and eliminating potential problems". A pilot study involves testing the wordings of question, identifying ambiguous questions, testing the techniques that used to collect data, and measuring the effectiveness of standard invitation to respondents.

Table (3.5): Results of questionnaire pretesting

.No	Position	Comments/suggestions
Participant A1	Projects manager	<ul style="list-style-type: none"> • Modified an item in the field of labor management barriers (in English language) to facilitate understanding. • Add examples of some factor in part 3 such as (negative influence , site condition , operating system) to be easy to understand. • Determine the classification of the company on any category
Participant B1	Site engineer	<ul style="list-style-type: none"> • Modified the wording (in Arabic language) of some questions and items of the different fields of the questionnaire, where they were in need for more explanation.
Participant C1	MSc in civil engineering	<ul style="list-style-type: none"> • Removed the numbers on each scale label and not bold and without underline. • Audited the cover letter of the questionnaire and the general structure of the questionnaire.
Participant D1	Contractor	<ul style="list-style-type: none"> • Modified the formulation of the main question in part3, part4, and part 5 to facilitate understanding.
Participant E1	Statistician	<ul style="list-style-type: none"> • All of the questions must started with capital letters. • Modified the wording of some items ((in terms of statistics)
Participant A2	Projects manager	The questionnaire fully clear and applicable, and can be distributed to .the proposed respondents
Participant B2	Site engineer	The questionnaire fully clear and applicable, and can be distributed to .the proposed respondents
Participant C2	MSc in construction management	The questionnaire fully clear and applicable, and can be distributed to .the proposed respondents
Participant D2	Company owner	The questionnaire fully clear and applicable, and can be distributed to .the proposed respondents
Participant E2	MSc in statistics	The questionnaire fully clear and applicable, and can be distributed .to the proposed respondents

To do a pilot study, researcher needs to test all the survey steps from start to finish with a reasonably large sample. The size of the pilot sample depends on how big the actual sample is (Thomas, 2004). There is little published guidance concerning how large a pilot study should be. General guidelines, for example using 10% of the sample required for a full study, may be inadequate for aims such as assessment of the adequacy of instrumentation or providing statistical estimates for a larger study (Hertzog, 2008). According to that, 30% of the sample which equal 30 copies of the questionnaire were distributed conveniently to respondents from the target group (company's manager, project manager and site engineer). All copies were collected, coded, and analyzed through statistical Package for the social science IBM(SPSS) version 22. The tests that conducted were as follows:

1) Statistical validity of the questionnaire/ criterion related validity.

2) Reliability of the questionnaire by Half Split method and the Cronbach's coefficient Alpha method.

3.10.1 Statistical Validity of the Questionnaire

In quantitative research, validity is the extent to which a study using a particular tool measures what it sets out to measure. To insure the validity of the questionnaire, two statistical tests should be applied. The first test is criterion-related/internal validity test (Pearson test) which measures the correlation coefficient between each item in the field and the whole field. The second test is structure validity test (Pearson test) that used to test the validity of the questionnaire structure by testing the validity of each field and the validity of the whole questionnaire. It measures the correlation coefficient between one field and all the fields of the questionnaire that have the same level of similar scale (Garson, 2013).

3.10.1.1 Internal Validity Test

Internal consistency of the questionnaire was measured by the scouting sample (the sample of pilot study), which consisted of 30 questionnaires. It was done by measuring the correlation coefficients (Pearson test) between each item in one field and the whole field (Garson, 2013). Tables in appendix C from 1 to 4 show the correlation coefficient P-value for each item in each field. The test applied on the parts: 2) *Local labor management situation in contracting company*, 3) *Factors*

affecting of labor management that leading to achieving quality in contracting companies, 4) Factors that barring implementation of labor management in contracting companies in the Gaza Strip, 5) Best activities to have a good project quality during efficiently method in labor management). As shown in the tables C1, C2, C3, and C4 the correlation coefficient for each domain items were significant at $\alpha = 0.05$ and the P-values are less than 0.05, Thus, it can be said that the items of each field are consistent and valid to be measured what it were set for.

3.10.1.2 Structure Validity Test

Structure validity is the second statistical test that used to test the validity of the whole questionnaire. It measures the correlation coefficient between one field and all of the other fields of the questionnaire that have the same level of rating scale (five-point Likert scale) (Garson, 2013). As shown in table (3.6), the significance values are less than 0.05. Thus it can be said that the fields are valid to be measured what it were set for to achieve the main aim of the study.

Table (3.6): Structure validity of the questionnaire

No.	Field	Correlation Coefficient	P-Value (Sig.)
1.	The current situation of labor management in construction project	.538	0.001
2.	Factor affecting in labor management practice to achieve high project quality	.948	0.000
	Factor related to labor	.885	0.000
	Factors related to company's management	.914	0.000
	Factors related to project nature	.829	0.000
3.	Barriers that face implementing labor management in contracting company	.830	0.000
4.	The best labor management activities to enhance quality during project construction	.767	0.000

3.10.2 Reliability Test

Reliability is the degree of consistency or dependability with which an instrument (questionnaire for the study) measures what it designed to measure. The tests is doing by repeating the questionnaire to the same sample of the target group in a different time and comparing the scores that obtained in the first time and in the second time by computing a reliability coefficient is above (0.7). A period from two weeks to a month is recommended for distributing the questionnaires for the second time (Garson, 2013). Due to the complicated conditions, it was too difficult to ask the same sample to respond to the same questionnaire twice within short period. Thus, to overcome the distribution of the questionnaire twice to measure the reliability, Cronbach's alpha coefficient test should be applied.

Cronbach's Coefficient Alpha ($C\alpha$)

This method is used to measure the reliability of the questionnaire between each field and the mean of the whole fields of the questionnaire. The normal range of Cronbach's coefficient alpha ($C\alpha$) value is between 0.0 and +1 and the higher value reflects a higher degree of internal consistency (Garson, 2013). As shown in table (3.8), the Cronbach's coefficient alpha ($C\alpha$) was calculated for four fields. The results were in the range from 0.733 and 0.937 and the general reliability for all items equals 0.939. This range is considered high, where it is above 0.7. Thus, the result ensures and indicates an excellent reliability of the entire questionnaire.

As shown above, results of the statistical validity of the questionnaire (the internal and the structure of the questionnaire) as well as results of reliability tests (Cronbach's coefficient Alpha method) showed the success of the tests and thus the success of the questionnaire (valid and reliable). Thereby, the questionnaire was adopted and the 30 successful copies of the pilot study were included in the whole sample.

3.11 Final Amendment to the Questionnaire

After piloting, the questionnaire was adopted and distributed to the whole sample. Each field was simple and short to improve response rates (Dillman, 2000). As it turns out by explaining each step of the process of the questionnaire design and

development and according to the results of each step, some of those items have been selected, other items have been modified, while others have been merged, as well as some items have been added. In general, experts agreed that the questionnaire is suitable to achieve the goals of the study. The final questionnaire of this study was divided into five main parts as summarized in Table (3.9) below, and became ready to be for further analysis and discussion.

Table (3.7): Cronbach's Coefficient Alpha for reliability ($C\alpha$)

No.	Field	Cronbach's Alpha
1.	The current situation of labor management in construction project	0.733
2.	Factor affecting in labor management practice to achieve high project quality	0.937
	Factor related to labor	0.851
	Factors related to company's management	0.854
	Factors related to project nature	0.817
3.	Barriers that face implementing labor management in contracting company	0.815
4.	The best labor management activities to enhance quality during project construction	0.890
	All items of the questionnaire	0.939

3.12 Data Analysis

Statistical methods play a prominent role in most research that dependent on quantitative analysis of data through converting the ordinal data to numerical scale data by using the numerical rating scale. This way helps to conclude better results and linking them and comparing with the results of previous research to show the contrast and the extent of progress. Also, statistical analysis helps the researcher to identify the degree of accuracy of data and information of the study. It allows reporting of summery results in numerical terms to be given with a specified degree of confidence (Field, 2009).

The overall goal of data analysis is to arrive at a general understanding of the phenomenon under study. Data analysis categorized into descriptive analysis and

inferential analysis. The choice of statistics is determined by many previous decisions such as the method of analysis, level of measurement of the variables and complexity of the research question (De Vaus, 2013).

Table (3.8): Components of the Study questionnaire

No	Section title	Measurement scale	No of question
1	Respondent and company general information.	Nominal scale	9
2	Local labor management situation in contracting company.	Ordinal (Likert scale)	14
3	factors affecting of labor management that leading to achieving quality in contracting companies	Ordinal (Likert scale)	30
4	factors that barring implementation of labor management in contracting companies in the Gaza Strip	Ordinal (Likert scale)	16
5	Best activities to have a good project quality during efficiently method in labor management.	Ordinal (Likert scale)	14

Analysis of the data was undertaken using SPSS Statistics (Statistical Package for the Social Sciences) Version 24. The following quantitative measures were used for the data analysis:

A. Descriptive Statistics

1. Frequencies and Percentile.
2. measures of central tendency (the mean)
3. Measurement of dispersion based on the mean (standard deviation)
4. Relative Important Index (RII)

B. The inferential statistics (bivariate) / test of hypotheses

1. Pearson product-moment correlation coefficient/ Pearson's correlation coefficient (a parametric test).

2. Analysis of Variance (One way ANOVA) test (a parametric test).

3.12.1 Relative Importance Index (RII)

The relative importance index method (RII) was used to determine the ranks of items/ variables as perceived by the respondents in each of part 2, part 3, part 4, and part 5. The relative importance index was computed as (Field, 2009):

$$RII = \frac{\sum W}{A * N} \text{ Where:} \quad \text{(Equation 3.4)}$$

W = the weighting given to each factor by the respondents (ranging from 1 to 5)

A = the highest weight (i.e. 5 in this case)

N = the total number of respondents

The RII value had a range from 0 to 1 (0 not inclusive), the higher the value of RII, the more impact of the attribute. However, RII doesn't reflect the relationship between the various items.

3.12.2 Test of Normality

In order to recognize whether or not the data obtained by the questionnaire can be categorized under the normal distribution. The Normal Distribution Test (Kolmogrov-Smirnov Z) was used to decide which type of statistical tests can be used to analyze the collected data either by the parametric tests or the non-parametric tests. If the calculated value of significance is more than 0.05, then the collected data are of normal distribution and all the parametric tests can be applied. The tabulated value of Z is taken at significance value (p-value) equal 0.05 (means 95% confidence interval with 5% as confidence level).

Table (3.9) shows the results for Kolmogorov-Smirnov test of normality. From Table (3.9), the p-value for each variable is greater than 0.05 level of significance, then the distributions for these variables are normally distributed. Consequently, parametric tests should be used to perform the statistical data analysis.

Table (3.9): Kolmogorov-Smirnov test

Field	Test value	P-value
The current situation of labor management in construction project	0.762	0.607
Factor related to labor	0.541	0.932
Factors related to company's management	0.572	0.899
Factors related to project nature	0.658	0.780
Factor affecting in labor management practice to achieve high project quality	0.607	0.855
Barriers that face implementing labor management in contracting company	0.474	0.978
The best labor management activities to enhance quality during project construction	0.611	0.850
All items of the questionnaire	0.632	0.820

3.12.3 Parametric Tests

Parametric test: a test that requires data from one of the large catalogue of distributions that statisticians have described. Normally this term is used for parametric tests based on the normal distribution, which require four basic assumptions that must be met for the test to be accurate: a normally distributed sampling distribution (researcher can approximate using a normal distribution after invoking the central limit theorem), homogeneity of variance, interval or ratio data, and independence (Field, 2009).

3.12.5.1 Pearson's Correlation Coefficient

Correlation refers to any of a broad class of statistical relationships involving dependence. The most familiar measure of dependence between two quantities (two sets of data or two variables) is the Pearson product-moment correlation coefficient, or "Pearson's correlation coefficient", commonly called simply "the correlation coefficient". It shows the linear relationship between two sets of data. Two letters are used to represent the Pearson correlation: Greek letter rho (ρ) for a population and the letter (r) for a sample. The Pearson's product-moment coefficient measures the strength and direction of the relationship between two quantitative variables. It is

used to measure the strength of a linear association between two variables, where the value $r = 1$ means a perfect positive correlation and the value $r = -1$ means a perfect negative correlation. The sign of (r) denotes the nature of the relationship, while the value of (r) denotes the strength of relationship (Field, 2009).

Requirements to apply the test

- 1) Scale of measurement should be interval or ratio
- 2) Variables should be approximately normally distributed
- 3) The association should be linear
- 4) There should be no outliers in the data

3.12.5.2 One way ANOVA (F-test)

One-way analysis of variance (abbreviated one-way ANOVA) provides a parametric statistical test of whether or not the means of several groups are equal (by using the Fratio), and therefore generalizes the t-test to more than two groups. Critical value of F: at degree of freedom (df) = [(K-1), (N-K)] at significance (probability) level (α) = 0.05 (Field, 2009).

Chapter (4)

Results and Discussion

Chapter 4

Results and Discussion

This chapter included analysis and discussion of the results that have been gathered from field surveys. First section presents the profile and all necessary information about the respondents. Other sections in the questionnaire were designed to attain the objectives of this research. A total of 88 completed copies had been returned, representing a valid response rate of (88%). Data was analyzed using Statistics SPSS (Statistical Package for the Social Sciences) Version 24 including descriptive and inferential statistical tools. In addition, this chapter features the results of testing hypotheses. It also includes discussing and commenting on each hypothesis in light of the study problem.

4.1 Respondent's Profile

The target respondents of the questionnaire survey were engineers (experienced projects managers, site engineers and company owner) at the contracting companies in the Gaza Strip. This section of questionnaire mainly designed to provide general information about the respondents and their companies. Table (4.1) represents the characteristics of respondents.

1) Job Description

In regard to the job description of respondents, the highest percentage are site engineers of (59.1%) followed by (23.8 %) of the respondents are project manager, (11.3%) of the respondents are other position and (5.7%) are company owner. It should be noted that "other" included chairman, director of the office and director of the department. Also this percentage referred to the fact that the site engineers are the most available individuals in the sites in all companies. Furthermore, they are the most individuals who face all the problems in the site followed by project managers who are most of the times available in the sites, while companies owners are mostly available in the offices. In addition, results indicated that the majority of persons filling the questionnaire, (82.9 % of the respondents) are site engineers and project managers. Due to this result, it can be inferred that accuracy in the collected data is expected.

2) Years of Experience in the Construction Works

About respondents experience in the construction works the percentages shows that (25%) of the respondents have less than 3 years, (11.3 %) have from 3 to less than 5 years, (43.1%) have 5 to less than 10 years and (20.5%) of the respondents have more than 10 years. This result is referred that engineers who have experience between (5-less than 10 years) are the most active at work and who have the good ability to follow, manage and develop the constructions, followed by the less than 5 years' experience category, who are mostly required by contractors as they don't require high fees.

3) Company Classification

Table (4.1) shows the number and percentage of contractors' categories according to classification of PCU. It is shown that (59 %) from the companies sample classified a first class, (34 %) is a second class and (7%) is a third class. This results increases the credibility and reliability of the results.

4) Years of Experience of the Company

As appeared in Figure (4.1), (21%) of the respondents have an experience less than 5 years, (31%) have an experience from 5 years to 10 years, and (47.7%) have experience over than 10 years. Based on the this statistics, it can be inferred that a lot of target contractors have experience between medium to long term. This range of experience gives them the ability to manage labor effectively and provide accurate and reliable information to the questionnaire.

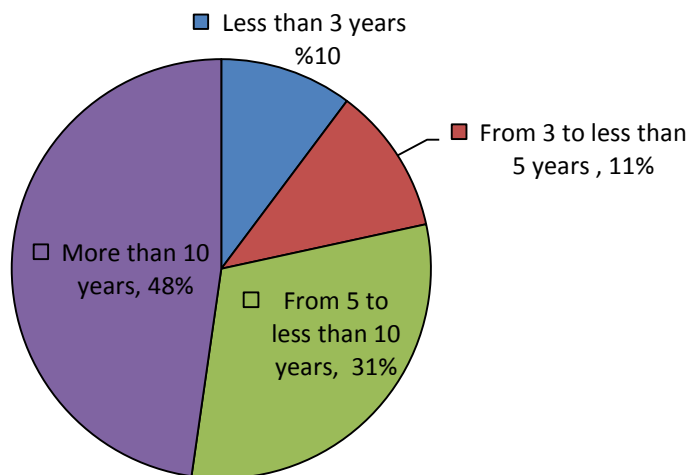


Figure (4.1): Years of experience of the company

Table (4.1): Respondent's Profile

Information about respondents	Categories	Frequency	Percentage
Job description	Project manager	21	23.8
	Company owner	5	5.7
	Site engineer	52	59.1
	Others	10	11.3
Your experience in the construction works	Less than 3 years	22	25
	From 3 to less than 5 years	10	11.3
	From 5 to less than 10 years	38	43.1
	More than 10	18	20.5
Your company classification according (PCU)	First class	52	59
	Second class	30	34
	Third class	6	7
Your company experience in the construction industry	Less than 3 years	9	10.2
	From 3 to less than 5 years	10	11.4
	From 5 to less than 10 years	27	30.7
	More than 10	42	47.7
Your company size (number of workers)	Less than 10	15	17.0
	From 11 to 30	40	45.5
	From 31 to 50	17	19.3
	More than 50	16	18.2
Types of implemented projects through yours company in the last five years	Residential	27	30.7
	Infrastructure	36	40.9
	Public buildings	23	26.1
	Electric and Mechanic	2	2.3
Number of executed projects in the last five years by your company	5 projects or less	16	18.2
	5-10 projects	34	38.6
	10-15 projects	26	29.5
	More than 15	12	13.6
Total value of executed projects during the last five years (million dollars)	Less than 1 million	8	9.1
	From 1 to less than 2 million	16	18.2
	From 2 to 5 million	33	37.5
	More than 5 million	31	35.2
Number of permanent worker in company	10 persons or less	39	44.3
	11-20 persons	37	42.0
	21-30 persons	7	8.0
	More than 30 persons	5	5.7

5) Company Size (number of workers)

Regarding to the number of worker, the highest percentage of (45.5%) from 11 to 30 worker then (19.3%) from 31 to 50 worker then (18.2%) more than 50 worker and (17%) less than 10 worker. From previous result it is concluded that (62.5%) of contracting companies in Gaza Strip employ 30 workers or less. This indicate that most of contracting companies in Gaza Strip are small size companies.

6) Types of Implemented Projects Through the Company

It could be noted that implemented projects in the last five years (30.7%) is residential, (40.9%) infrastructure, (26.1%) public buildings and (2.3%) electric and mechanic. This percent is referred to that the implemented project in each sector is proportional to the need of the market for constructions in the Gaza Strip.

7) Number of Executed Projects in the Last Five Years

Results also indicated that number of executed projects in the last five years (18.2 %) less than 5 projects, (38.6 %) from 5-10 projects, (29.5%) from 10-15 projects and (13.6%) more than 15 projects. As referred in Figure (4.2), the number of projects which have been raised in the same time was huge to some extent, and the number of companies is huge in comparison to the number of projects in the Strip. With no possibility for one company to have more than one project in the same time because of the lack of enough capitals.

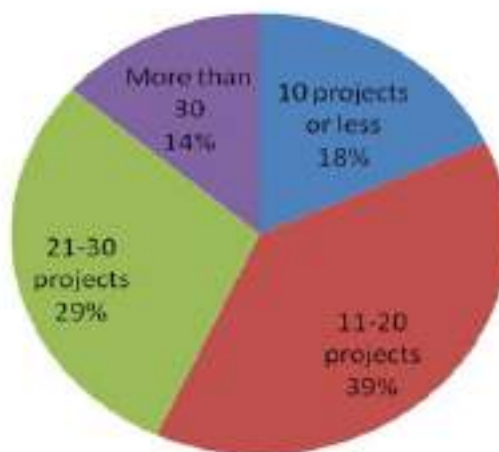


Figure (4.2) : Number of executed projects in the last five years

8) Total Value of Executed Projects During the Last Five Years

It could be noted that the total value of executed projects during the last five years (9.1%) less than 1 million, (19.2%) from 1 to less than 2 million, (37.5%) from 2 to 5 million and (35.2%) more than 5 million. The results revealed that most of executed projects in last five years in Gaza Strip are moderate size because (65.8%) of companies executed projects less than 5 million.

9) Number of Permanent Worker in Company

From table (4.1), it is shown that (44.3%) of the surveyed contracting companies have 10 persons or less, (42%) is from 11-20 persons, (8%) is from 21-30 persons and (5.7%) more than 30 persons. This is evidence that the majority of contracting companies are a small size in regarding to number of permanent worker which means that contracting companies depend on hiring subcontractors in the construction projects.

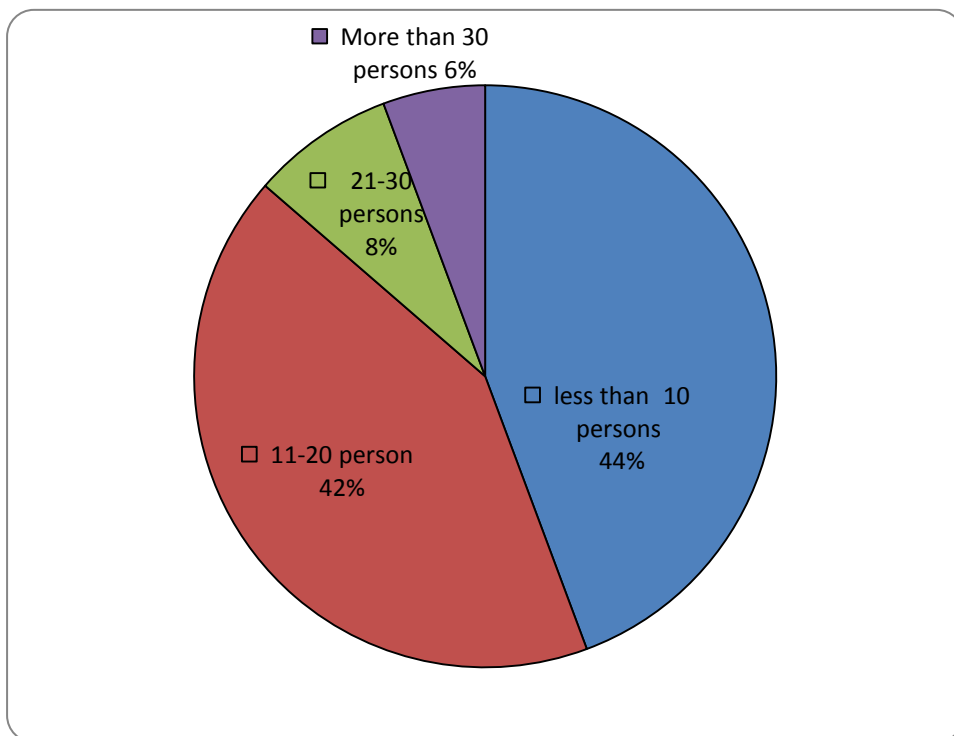


Figure (4.3): Number of permanent worker in company

4.2 The Current Situation of Labor Management in Construction Project

The first objective of this study was proposed to assess the current situation of labor management in construction projects. To achieve this objective, the second part of questionnaire was framed in such a way to get general views of the respondents on the aspects and features of labor management. This field contains 13 statements. These statements were subjected to the views of respondents, and the outcomes of the analysis were shown in Table (4.2). The descriptive statistics, i.e. means, standard deviations (SD), t-value (two-tailed), probabilities (P-value), Relative Importance Indices (RII), and ranks were established and presented in Table (4.2) as follows:

Table (4.2): The current situation of labor management in construction project

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
1.	Good communication between labor	3.92	0.53	78.41	16.29	0.000	1
10	The company has a program for worker health and safety site	3.67	0.89	73.41	7.04	0.000	2
8	Labor wages represent important part of the project overall cost	3.34	1.00	66.90	3.22	0.001	3
6	There is gab between knowledge and application in labor management	3.27	0.90	65.35	2.76	0.004	4
11	The company has system for personal motivation	3.15	1.14	62.95	1.22	0.114	5
4	Company have a labor training program	3.10	1.05	62.07	0.92	0.179	6
12	The company has a method to recruiting worker method	2.92	1.11	58.39	-0.67	0.251	7
3	Understanding between labor crow and supervision crow	2.82	1.02	56.36	-1.67	0.050	8
9	Company have a labor monitoring strategy	2.78	0.98	55.53	-2.10	0.019	9
5	The performance of workers is classified as highly productive	2.74	0.96	54.77	-2.54	0.006	10
2	Skilled and experience labor force	2.61	1.07	52.27	-3.40	0.001	11
7	My company providing strategy to managing labor	2.60	1.05	51.95	-3.57	0.000	12
13	Company regularly assessing the compliance to all legal obligations related to labor	2.34	1.02	46.82	-6.09	0.000	13
	All items of the field	3.02	0.47	60.42	0.42	0.337	

The numerical scores obtained from the questionnaire responses provided an indication of the current situation of labor management of respondents. The statements were ranked according to their concepts, as well as overall concepts. The ranks start from first statement with (78.41%) to (46.82%) for thirteen (Table 4.2). It worth mentioning that ranking of the statements was based on the highest mean and RII. Table (4.2) shows the following results:

- The mean of item #1 “Good communication” equals 3.92 (78.41%), Test-value = 16.29, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. These results are normal and expected. Often, there are a convergence in the way of the thinking and culture between the workers in the construction which facilitates communication between them, furthermore most of the workers are from a geographical limited area (Gaza Strip).
- The mean of item #10 “The company has a program for worker health and safety site ” equals 3.67 (73.41%), Test-value = 7.04, and P-value less than 0.05. The sign of the test is positive, and have the 2nd rank so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. This result stand out due to fear of companies from injuries and accidents and the damage consequent on it, so that companies concerned with safety factors and worker health. In addition to the request of financiers for these procedures.
- The mean of item #13 “Company regularly assessing the compliance to all legal obligations related to labor” equals 2.34 (46.82%), Test-value = -6.09, and P-value less than 0.05. The sign of the test is negative, so the mean of this item is significantly smaller than the hypothesized value 3. It is concluded that the respondents disagreed to this item. As shown that majority of contracting companies in Gaza Strip doesn't or sometime regularly assessing the compliance to all legal obligations related to labor. This means that rights of employees are sometime lost in contracting companies in Gaza Strip and this is represent obstacle to labor working in contracting company.

The mean of item #13 “company providing strategy to managing labor” equals 2.6 (51.95%), Test-value = -3.57, and P-value less than 0.05. The sign of the test is negative, so the mean of this item is significantly smaller than the hypothesized value

3. It is concluded that the respondents disagreed to this item. This result show that contracting company suffer from lacking of a strategy to managing labor which arises from the lack of consistency of workers and their frequent mobility among companies.

- The mean of the field “The current situation of labor management in construction project” equals 3.02 (60.42%), Test-value = 0.42 and P-value = 0.337 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to field of “The current situation of labor management in construction project ”.

4.3 Factor Affecting in Labor Management to Achieve High Project Quality

This part shows the results of the responding regarding three parts of factors (total 30 factors) taken from the literature review and adapted by modifying or merging according to the results of face validity and pretesting of the questionnaire as shown in chapter 3. These items were subjected to the views of respondents and were analyzed. The descriptive statistics, i.e. means, standard deviations (SD), t-value (two-tailed), probabilities (P-value), relative importance indices (RII), and ranks were established and presented in Tables (4.3), (4.4), and (4.5) and divided as :

Part 1) Factors related to labor.

Part 2) Factors related to company's management.

Part 3) Factors related to project nature.

4.3.1 Factors Related to Labor

RII was calculated to weight each factor (from #1 to #13) according to the numerical scores obtained from the questionnaire responses and results have been ranked from the highest degree (the most important factor) to the least degree (the lowest important factor). It worth mentioning that ranking of factors related to workers were based on the highest mean, RII, and the lowest SD. If some items have similar means and RIIs, as in the case of (#7 and #1); ranking will be depended on the lowest

SD. More precisely, although #7 and #1 have the same mean and RIIs, but #7 is ranked higher than the #1 because it has lower SD as shown in Table (4.3).

Table (4.3): Factors related to labor

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
3	Labor skill and competency	3.33	1.40	66.67	2.22	0.015	1
9	Mutual trust between labor in project	3.26	1.02	65.29	2.43	0.009	2
2	Fair wage	3.19	1.27	63.86	1.43	0.078	3
5	The labor was affected by negative factors of life	3.18	0.97	63.64	1.77	0.040	4
8	Absenteeism at work site	3.12	1.15	62.33	0.94	0.176	5
6	Labor culture	3.11	0.84	62.27	1.27	0.103	6
7	Worker hour- determined	2.98	0.97	59.55	-0.22	0.413	7
1	Labor age	2.98	0.99	59.55	-0.21	0.415	7
13	Effectiveness of labor to participate in the development of labor management	2.93	1.06	58.64	-0.60	0.274	9
12	Mechanisms for contract	2.88	1.04	57.50	-1.13	0.131	10
4	Understand to responsibility.	2.87	1.17	57.47	-1.01	0.158	11
10	Sequence of work and its continuously	2.86	1.04	57.24	-1.24	0.109	12
11	Role of union of labor	2.82	1.29	56.32	-1.33	0.094	13
	All items of the field	3.04	0.40	60.77	0.89	0.187	

Table (4.3) shows the following results:

- The mean of item #3 “Labor skill and competency” equals 3.33 (66.67%), Test-value = 2.22, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. These results reflect a real fact. The more efficient and skilled the worker is, the quality of the projects greater. This result was agreed with several studies discussed it in literature review as Okoye and Ezejiofor (2013) and Amanuel (2016).

- The mean of item #9 “Mutual trust between labor in project” equals 3.26 (65.29%), Test-value = 2.43, and P-value less than 0.05. The sign of the test is

positive, so the mean of this item is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to this item. The result indicated that the moral factor is very important in influencing the quality of work and getting it out better, and achieving the satisfaction of the worker. In this study, it put the moral factor in an advanced position rather than material factor such as fair wages which is what is noted in everyday life and is in line with the study of Lee and Lee (2009).

- The mean of item #11 “Role of union of labor” equals 2.82 (56.32%), Test-value = -1.33, and P-value = 0.094 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item. This result reflects that there is no active role of union in representing workers, while in other countries it has an important role to play. These results contradict with previous results, such as L. Ding et al. (2013) and Trebilcock (2015) which highlighted the importance of the role of the union and its impact on the performance of workers.

- The mean of item #10 “Sequence of work and its continuously” equals 2.86 (57.24%), Test-value = -1.24, and P-value = 0.109 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item.). Sequence of work and its continuously was ranked as twelfth factor in this part. This stems from the fact that the worker's continuity does not directly affect the worker, but with the time promoters it has a negative effect and hence was close to the middle state(neutral). This result is agreed with study of Dada (2003).

- The mean of the field “factor related to labor” equals 3.04 (60.77%), Test-value = 0.89 and P-value = 0.187 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to field of “Factor related to labor”.

4.3.2 Factors Related to Company's Management

Table (4.4) shows the results of the respondents about the factors related to company's management issues. RII was calculated to weight each factor (from #1 to #10) according to the numerical scores obtained from the questionnaire responses and ranked the factors (10 factors in this part) from high to low.

Table (4.4): Factors related to company's management

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
2	Good and fair subcontract condition	3.30	1.02	65.91	2.72	0.004	1
1	Skill and experience of managing staff	3.27	1.32	65.45	1.94	0.028	2
4	Labor operating system (lump sum- daily wage)	3.22	1.10	64.32	1.84	0.034	3
5	Amount of contractors cash flow	3.18	1.36	63.64	1.25	0.107	4
6	Top management support for projects worker	3.17	1.22	63.41	1.32	0.096	5
3	Scheduling of tasks	3.11	1.07	62.27	1.00	0.160	6
7	Investment in research and development and feedback from previous projects	3.05	1.09	60.91	0.39	0.349	7
9	Taking the reputation of the company into consideration	3.03	1.18	60.68	0.27	0.393	8
8	The company lacks long-term vision and it is short-term oriented	3.01	1.01	60.23	0.11	0.458	9
10	Labors rotation in company to develop their skills	3.00	0.97	60.00	0.00	0.500	10
	All items of the field	3.13	0.70	62.68	1.81	0.037	

Table (4.4) shows the following results:

- The mean of item #2 “Good and fair subcontract condition” equals 3.30 (65.91%), Test-value = 2.72, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. It was ranked in the first position so this result indicated without a doubt, the contracting of the most

important effects in the quality of the project, in order to ensure profit for all parties. This appear from the study of Hendrickson and Au (2000).

- The mean of item #1 “Skill and experience of managing staff ” equals 3.27 (65.45%), Test-value = 1.94, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. The importance of this factor result from that the success of the management in any construction project depend on the qualification and skills of the project team, also the lack of it, can effect negatively on the performance and quality of the project and therefore effect on the labor management which is agreed with study of Chand (2014) and Chan and Tam (2000).

- The mean of item #10 “Labors rotation in company to develop their skills” equals 3.00 (60.00%), Test-value = 0.00, and P-value = 0.500 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item. From this result the rotation of workers in construction companies is not very effective because the workers in the Gaza Strip are mostly mobile and all are professionals. It is not easy to move workers between one specialty and another. There are no workers in the sector who can do a multi jobs at the same time. So from this point this study disagree with Lill (2008) which state the rotation may be useful.

- The mean of item #8 “The company lacks long-term vision and it is short-term oriented” equals 3.01 (60.23%), Test-value = 0.00, and P-value = 0.500 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item. This bring us to the importance of long-term vision because fair of managers appraisal in most and feedback can avoid the company a lot of problem. The result consistent with Loosemore et al. (2003)While short term oriented it used in companies that change the nature of their projects according to available funding.

- The mean of the field “Factors related to company's management” equals 3.13 (62.68%), Test-value = 1.81, and P-value less than 0.05. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to field of “Factors related to company's management ”.

4.3.3 Factors Related to Project Nature

Table (4.5) shows the opinion of respondents about the factors related to project's issues according to relative importance index ranked from high to low. RII was calculated to weight each factor (from #1 to #7) according to the numerical scores obtained from the questionnaire responses. If some items have similar means and RIIs, as in the case of (#3 and #1); ranking depend on the lowest SD. More precisely, although #3 and #1 have the same mean and RIIs, but #3 is ranked higher than the #1 because it has lower SD as shone in Table (4.5).

Table (4.5): Factors related to project nature

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
4	Design change and late information	3.22	1.09	64.32	1.86	0.033	1
2	Site condition and environment (light ,noise , cold)	3.11	1.02	62.27	1.04	0.150	2
6	Incliment weather	3.09	1.14	61.82	0.75	0.228	3
3	Housekeeping and service to labor	3.02	0.91	60.45	0.23	0.408	4
1	Uniqueness of project and ease to do	3.02	1.04	60.45	0.21	0.419	4
7	Site safety and healthy factor	3.01	1.18	60.23	0.09	0.464	6
5	Poor specification	2.75	1.03	55.00	-2.27	0.013	7
	All items of the field	3.03	0.43	60.65	0.71	0.239	

Table (4.5) shows the following results:

- The mean of item #4 “Design change and late information” equals 3.22 (64.32%), Test-value = 1.86, and P-value less than 0.05. The sign of the test is

positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. This result indicate that the increasing of the fundamental changes lead to rework and lead to increase the cost of the work, thus may effect on the management of the labor that hate the reworks and may make problems with managers. This result agreed with Dada (2003).

- The mean of item #2 “Site condition and environment” (light, noise, cold) equals 3.11 (62.27%), Test-value = 1.04, and P-value greater than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3 . It is concluded that the respondents agreed to this item. It is obvious that weather factors affect the quality of the project and lead to the delay of time, increase of cost and some damage, so it is one of the most important factors that relate to the nature of the project where it came in the second order in this part. This is agree with study of Enshassi et al. (2009) and Fagbenle et al. (2011).

- The mean of item #5 “Poor specification” equals 2.75 (55.00%), Test-value = -2.27, and P-value less than 0.05. The sign of the test is negative, so the mean of this item is significantly smaller than the hypothesized value 3 . It is concluded that the respondents disagreed to this item. The importance of this factor is because the commitment of the labor management to the specification and quality system of the project make it easier for the manager to control and manage them correctly and in the opposite side the lack of commitment of the labors to the specification produce problems between the manager and them so it will affect negatively on the management of the labor in the construction project. This is support the study of Fagbenle et al. (2011) and Dada (2003).

- The mean of the field “Factors related to project nature” equals 3.03 (60.65%), Test-value = 0.71 and P-value = 0.239 which is greater than the level of significance $\alpha = 0.05$. The mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to field of “Factors related to project nature ”.

4.3.4 Summary of Factors Affecting in Labor Management to Achieve High Project Quality

Table (4.6) shows the opinions of the respondents about the groups of factors affecting on labor management to achieve high quality in construction project in the Gaza Strip according to relative index from high to low.

Table (4.6): Rank and mean of groups of factors affecting on the labor management

	Group	Mean	Rank
1	Factors related to company's management	3.13	1
2	Factors related to labor	3.04	2
3	Factors related to project nature	3.03	3
	All items of the field	3.06	

From Table (4.6), it is shown that, "Factors related to company's management" was ranked in the first position with a mean value of (3.13). This emphasizes that, It is the most important group of factors that affecting labor management in construction project in the Gaza Strip. Company's management plays a vital role in enhancing the management of the labors works in the project to finish the project with best way because leadership skills for project manager affect the degree of project performance.

On the other hand, it is shown that, the respondent rank the group of "Factors related to labor" in the second position of the factors group affecting on the labors management in the construction project in the Gaza Strip with a mean value of (3.04). This means that the labor play a moderate role in success of labor management in the construction project, so it should choose the suitable labor with high experience and skills.

Finally, it is shown that, "Factors related to project's nature" was ranked in the last position by both responses with a mean value of (3.03).

4.4 Barriers that Face Implementing Labor Management in Contracting Companies

This field contains 16 items of labor management barriers and this list of the 16 items was taken from the literature review and adapted by modifying or merging according to the results of face validity and pretesting of the questionnaire as shown in chapter 3. These items were subjected to the views of respondents and were analyzed. The descriptive statistics, i.e. means, standard deviations (SD), t-value (two-tailed), probabilities (P-value), relative importance indices (RII), and ranks were established and presented in Table (4.7).

Table (4.7): Means and Test values for “Barriers that face implementing labor management in contracting company”

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
16	In effective management	3.18	1.14	63.64	1.50	0.069	1
15	Fragmentation of the construction process (Increased industry parties and divided processes)	3.17	0.92	63.45	1.75	0.042	2
5	Stability of political condition	3.17	1.07	63.41	1.49	0.070	3
4	Dissatisfaction with labor organization	3.15	1.08	62.95	1.29	0.101	4
14	Lack of training	3.14	1.21	62.73	1.06	0.146	5
3	High mobility of construction worker	3.06	0.86	61.14	0.62	0.269	6
2	Poor image to industry	3.03	0.75	60.68	0.43	0.335	7
13	Lack of motivation	3.02	1.14	60.45	0.19	0.426	8
7	Difficult in measuring productivity	2.99	0.91	59.77	-0.12	0.453	9
8	Lack of alignment goal	2.98	1.02	59.54	-0.21	0.417	10
10	Globalization and culture difference	2.97	1.07	59.32	-0.30	0.382	11
11	Contractual condition	2.94	0.90	58.86	-0.59	0.278	12
6	High number of employees in project	2.93	0.91	58.62	-0.71	0.241	13
9	Growth of self-employment	2.83	0.89	56.59	-1.80	0.037	14
12	Problem related with issue of women	2.82	1.23	56.36	-1.39	0.084	15
1	New technology which required special skills	2.72	0.84	54.32	-3.16	0.001	16
	All items of the field	3.01	0.58	60.14	0.11	0.456	

Table (4.7) shows the following results:

- The mean of item #16 “In effective management” equals 3.18 (63.64%), Test-value = 1.50, and P-value = 0.069 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is significantly greater than the hypothesized value 3. It is concluded that the respondents agree to this item. This result show that the essence of effective leadership is motivating your team to consistently perform while instilling a desire to improve, as well as cultivate employee loyalty to colleagues and the company. This lead to increase productivity of labor and commitment to their duties and responsibilities. If this effective management not found, the previous speech can't be achieved. This finding was supported by studies Mullins (2007), Loosemore et al. (2003), Attar et al. (2012).

- The mean of item #15 “Fragmentation of the construction process” equals 3.17 (63.45%), Test-value = 1.75, and P-value = 0.069 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is significantly greater than the hypothesized value 3. Also the item #5 "Stability of political condition" have the same mean and Test-value = 1.75. It is concluded that the respondents agree to this item. From the previous result it seem that fragmentation of the construction process is second important factor barrier labor management because that is characterized by a lack of a sense of identity, promoting a confrontational culture and a lack of feedback loops or coordination between the design and construction. Furthermore, the traditional design and construction process is conducted in a sequential manner and is constructed of segregated professionals labor (lack of interaction between contractors and designers) during the design and construction phase. This often results in inefficiencies during the construction phase such as increased project complexity, rework, increasing costs and longer construction duration. This result is compatible with result of study Nawi, Nasrun, Baluch, and Bahaudin (2014) and Loosemore et al. (2003) .

In addition to that the political factors are an important obstacle in the management of workers and their impact on quality such as the closure of crossings, high prices and lack of good which agree with study of Enshassi and Ayyash (2014) and Najmi (2011).

- The mean of item #1 “New technology which required special skills” equals 2.72 (54.32%), Test-value = -3.16, and P-value less than 0.05. The sign of the test is negative, so the mean of this item is significantly smaller than the hypothesized value 3 . It is concluded that the respondents disagreed to this item. The technology in our society in the Gaza Strip does not constitute a major obstacle as shown in the questionnaire results because many of the machines are known and most projects are one pattern, except that there is little that done to the entry of equipment's that need special skills to use. This result disagree with a number of studies Lill (2008), And which confirmed that great reliance on technology and has a significant impact on the projects.

- The mean of item #12 “Problem related with issue of women ” equals 2.82 (56.36%), Test-value = -1.39, and P-value greater than 0.05. The sign of the test is negative, so the mean of this item is significantly smaller than the hypothesized value 3 . It is concluded that the respondents disagreed to this item. This result reflect the culture of society in the Gaza Strip that there is no woman working in the construction sector, It was normal result. The issue of women does not constitute an obstacle to the management of workers . this result agreed with result of Lill (2008) and Dainty et al. (2007)

- The mean of the field “Barriers that face implementing labor management in contracting company” equals 3.01 (60.14%), Test-value = 0.11 and P-value = 0.456 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to field of “Barriers that face implementing labor management in contracting company ”.

4.5 The Best Labor Management Activities to Enhance Projects Quality

This field contains 14 items of labor management activities to enhance quality during project construction. RII was calculated to weight each item according to the numerical scores obtained from the questionnaire responses. The numbers in the “rank” column represent the sequential ranking. It worth mentioning that ranking of this part was based on the highest mean, RII, and the lowest SD. If some items/ variables have similar means and RIIs, as in the case of (#8 and #1); and (#11 , #9 and #14), ranking will be depended on the lowest SD. More precisely, although # 8 and # 1 have the same mean and RIIs, but(#8) is ranked higher than the (#1) because it has lower SD. The same thing was done for(#11 , #9 and #14) as shown in Table (4.8).

Table (4.8): Means and Test values for “The best labor management activities to enhance quality during project construction”

	Item	Mean	S.D	RII (%)	Test value	P-value	Rank
10	Use of machine and automated system	3.45	1.18	69.07	3.55	0.000	1
8	Maintain work discipline	3.25	1.35	65.00	1.74	0.043	2
1	On time payment to the worker	3.25	1.40	65.00	1.68	0.049	2
11	Good strategy to recruiting worker	3.24	1.08	64.77	2.07	0.021	4
9	Facilities to labor	3.24	1.20	64.77	1.86	0.033	4
14	Motivation to worker(Bonus, Incentives)	3.24	1.20	64.77	1.86	0.033	4
7	Advance site layout	3.23	1.23	64.55	1.73	0.043	7
6	Implementing best practice for quality engineering	3.22	1.08	64.32	1.88	0.032	8
5	Monitoring to labor performance	3.20	1.30	64.09	1.48	0.071	9
3	Corporative relation between labor and management	3.15	1.17	62.95	1.18	0.120	10
13	Training the worker(improve skills , developed performance)	3.14	1.26	62.73	1.01	0.157	11
2	Unified labor law	3.10	1.14	62.05	0.85	0.200	12
12	Delegation responsibilities	3.06	1.47	61.15	0.37	0.358	13
4	Prompt challenge and accomplishment	3.00	0.91	60.00	0.00	0.500	14
	All items of the field	3.20	1.02	63.99	1.83	0.035	

Table (4.8) shows the following results:

- The mean of item #10 “Use of machine and automated system” equals 3.45 (69.07%), Test-value = 3.55, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to this item. Undoubtedly, the use of modern equipment saves time and effort, facilitates the management of workers on site, and also has a clear impact on the quality of the project. This result is agree with Attar et al. (2012).

- The mean of item #10 “Maintain work discipline” equals 3.25 (65%), Test-value = 1.74, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to this item. Maintaining discipline in the workplace is vital in creating a safe and comfortable working environment for both labors and the management. Without rules, employees might be inclined to do whatever they want. The responsibility of workplace discipline and the rules and regulations set forth by the business usually falls to manager maintaining discipline lead to high quality. This is in the line with study of Chand (2014).

- Also The mean of item #10 “On time payment to the worker” equals 3.25 (65%), Test-value = 1.68, and P-value less than 0.05. The sign of the test is positive, so the mean of this item is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to this item. It could be noted from this result which agree with Attar et al. (2012) that paying the wages on time gives a great motivation to workers, and increases their affiliation to work. which is certainly reflected positively on the quality of the project.

- The mean of item #4 “Prompt challenge and accomplishment” equals 3.00 (60.00%), Test-value = 0.00, and P-value = 0.500 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item. This result indicated that not all workers are affected by the challenge and competition in the work, there are those who work for the salary and only, and not inspired by other influences, while finding those who care about attaining

achievements and challenges and hence the result was in the neutral position. This finding is agree with the study of Srivastava and Barmola (2012).

- The mean of item #12 “Delegation responsibilities” equals 3.06 (61.15%), Test-value = 0.37, and P-value = 0.358 which is greater than the level of significance $\alpha = 0.05$. Then the mean of this item is insignificantly different from the hypothesized value 3. It is concluded that the respondents (Do not know, neutral) to this item. This result refer to delegation is transfer of responsibility for the performance of an activity from one person to other which include determines the outcome we desire to the people you trust to delivery, Establish controls, identify limits to the work and provide sufficient support, but resist upward delegation.in addition keep up to date with progress, and focus on results rather than procedures. This is a way to improve labor management which enhance project quality.

- The mean of the field “The best labor management activities to enhance quality during project construction” equals 3.20 (63.99%), Test-value = 1.83, and P-value less than 0.05. The sign of the test is positive, so the mean of this field is significantly greater than the hypothesized value 3. It is concluded that the respondents agreed to field of “The best labor management activities to enhance quality during project construction ”.

4.6 Test of Research Hypotheses

Five hypotheses have been put to study relations between a numbers of variables of labor management by contracting companies and its effect on project quality in the Gaza Strip. According to Figure (4.4), Five hypotheses were tested through applying the Pearson product-moment correlation coefficient (Pearson's correlation coefficient). The Pearson's correlation coefficient was used to measure the strength and direction of the relationship (linear association/ correlation) between two quantitative variables, where the value $r = 1$ means a perfect positive correlation and the value $r = -1$ means a perfect negative correlation.

Each hypothesis was tested separately. The four variables in Figure (4.4) represent the three parts of factors related to labor management in the questionnaire and the best labor management practice to achieve high quality.

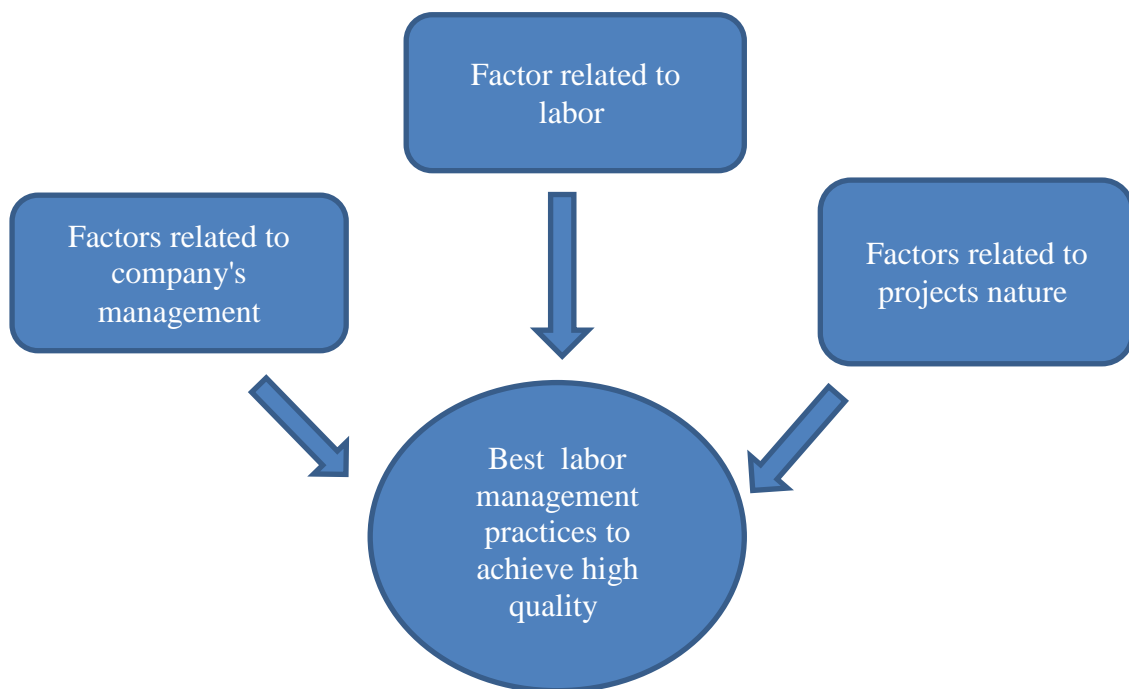


Figure (4.4) : Hypotheses model

According to Figure (4.4), the study contains five hypotheses as follow :

H1: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between factors related to labor and the best labor management practices to enhance projects quality.

H2: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to company's management and the best labor management practices to enhance projects quality.

H3: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to project nature and the best labor management practices to enhance projects quality.

H4: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors affecting in labor management to achieve high project quality and the best labor management practices to enhance projects quality.

H5: There is a statistically significant differences attributed to the demographic data of the respondents and the way of their work at the level of $\alpha \leq 0.05$ between the averages of their views on the subject of effect labor management by contracting company on project quality.

4.6.1 Correlation between Factors Related to the Labors and the Best Labor Management practices to Enhance Projects Quality

H1: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between factors related to labor and the best labor management practices to enhance projects quality

Table (4.9) shows that the correlation coefficient between factors related to labor and the best labor management practices to enhance projects quality equals 0.670 and the p-value less than 0.05, so the correlation coefficient is statistically significant at $\alpha = 0.05$. It is concluded there exists a significant positive relationship between factors related to labor and the best labor management practices to enhance projects quality.

According to that, it can be said that the relationship between factors related to labor and the best labor management practices is an intermediate positive relationship because ($R= 0.670$). This means, when one variable increases in value, the second variable also increase in value. This positive influence with labor management methods must reflect to enhance project quality.

Table (4.9): Correlation coefficient between factors related to labor and the best labor management activities to enhance projects quality

Field	Correlation Coefficient	P-Value
There is apposite relationship, statistically significant at $\alpha \leq 0.05$, between factors related to labor and the best labor management practices to enhance projects quality.	.670	0.000

4.6.2 Correlation between Factors Related to Company's Management and the Best Labor Management Practices to Enhance Projects Quality

H2: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to company's management and the best labor management practices to enhance projects quality

Table (4.10) shows that the correlation coefficient between factors related to company's management and the best labor management practices to enhance projects quality equals 0.902 and the p-value less than 0.05, so the correlation coefficient is statistically significant at $\alpha = 0.05$. It is concluded there exists a significant positive relationship between factors related to company's management and the best labor management practices to enhance projects quality.

As it turns out previously in this chapter, results indicated the factors related to company's management has a very high positive relation ($R= 0.902$) with best method of labor management which explain the important role of management staff in labors management as well as project quality.

Table (4.10): Correlation coefficient between factors related to company's management and the best labor management activities to enhance projects quality

Field	Correlation Coefficient	P-Value
There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between factors related to company's management and the best labor management practices to enhance projects quality	.902	0.000

4.6.3 Correlation between the Factors Related to Project Nature and the Best Labor Management Practices to Enhance Projects Quality

H3: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors related to project nature and the best labor management practices to enhance projects quality.

Table (4.11) shows that the correlation coefficient between factors related to project nature and the best labor management practices to enhance projects quality equals 0.721 and the p-value less than 0.05, so the correlation coefficient is statistically significant at $\alpha = 0.05$. It is concluded there exists a significant positive relationship between factors related to project nature and the best labor management practices to enhance projects quality.

As it turns out previously in this chapter, results indicated that when factors related to project nature taken into consideration, it will be a positive influence in labor management methods therefore, it enhance the project quality.

Table (4.11): Correlation coefficient between factors related to project nature and the best labor management practices to enhance projects quality

Field	Correlation Coefficient	P-Value
There is apposite relationship, statistically significant at $\alpha \leq 0.05$, between factors related to project nature and the best labor management practices to enhance projects quality	.721	0.000

4.6.4 Correlation between the All Factors Affecting in Labor Management and the Best Labor Management Practices to Enhance Projects Quality

H4: There is a positive relationship, statistically significant at $\alpha \leq 0.05$, between the factors affecting in labor management to achieve high project quality and the best labor management practices to enhance projects quality.

Table (4.12) shows that the correlation coefficient between all factors affecting in labor management and the best labor management practices to enhance projects quality equals 0.882 and the p-value less than 0.05, so the correlation coefficient is statistically significant at $\alpha = 0.05$. It is concluded there exists a significant positive relationship between factors affecting in labor management to achieve high project quality and the best labor management practices to enhance projects quality.

As it turns out previously in this chapter, results indicated from this high relation ($R=0.882$) that if this factors was taken in consideration and care, it could have a good labor management practice and therefore, a high quality in projects.

Table (4.12): Correlation coefficient between all factors affecting in labor management and the best labor management practices to enhance projects quality

Field	Correlation Coefficient	P-Value
There is appositive relationship, statistically significant at $\alpha \leq 0.05$, between factors affecting in labor management and the best labor management practices to enhance projects quality	.882	0.000

4.6.5 Hypothesis Related to Respondents' Profiles

H5: There is a statistically significant differences attributed to the demographic data of the respondents and the way of their work at the level of $\alpha \leq 0.05$ between the averages of their views on the subject of effect labor management by contracting company on project quality.

This hypothesis was to analyze the differences among opinions of respondents toward the investigation the effect of labor management by contracting company on projects quality in the Gaza Strip due to job description, years' experience of respondents in the construction, company's classification, years company's experience, company's size, types of implemented projects, number and total value of executed projects and number of permanent worker in company.

The One Way Analysis of Variance (ANOVA) test were used to find whether there were statistically significant differences between opinions of respondents or not. All used tests are parametric tests based on the normal distribution.

4.6.5.1 Job Description

Table (4.13) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields “The current situation of labor management in construction project, Factor related to labor, Factor affecting in labor management practice to achieve high project quality and Barriers that face implementing labor management in contracting company”, then there is significant difference among the respondents toward this fields due to job description. It is concluded that the job description has an effect on this fields. This indicates that there are different degree of influence of factors related to labor administration as well as obstacles, especially in factors related to workers.

For the other fields, the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$, then there is insignificant difference among the respondents toward these fields due to job description. It is concluded that the job description has no effect on the other fields. That can be interpreted that respondents based on job description are close to each other in work scope and their knowledge about labor management is

convergent especially labor management in contracting companies in Gaza Strip is not implemented in satisfied manner.

Table (4.13): ANOVA test of the fields and their p-values for job description

No	Field	Means				Test Value	Sig.
		Project manager	Company manager	Site engineer	Other		
1.	The current situation of labor management in construction project	3.29	3.33	2.94	2.91	3.501	0.019
	Factor related to labor	2.79	2.97	3.08	3.18	3.173	0.028
	Factors related to company's management	2.75	3.36	3.21	3.20	2.142	0.101
	Factors related to project nature	2.79	3.00	3.11	3.04	2.481	0.067
2.	Factor affecting in labor management practice to achieve high project quality	2.78	3.11	3.13	3.16	2.961	0.037
3.	Barriers that face implementing labor management in contracting company	2.60	2.99	3.13	3.02	3.788	0.013
4.	The best labor management activities to enhance quality during project construction	2.60	3.26	3.33	3.36	2.385	0.075
	All items of the questionnaire	2.79	3.15	3.14	3.12	2.335	0.080

4.6.5.2 Experience of Respondent in the Construction Works

Table (4.14) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for each field, then there is insignificant difference among the respondents toward each field due to experience in the construction works. It is concluded that the experience in the construction works has no effect on each field. That can be interpreted that there is no tangible progress in labor management practice in contracting companies in Gaza Strip, where the knowledge of manager about labor management form at beginning of years' work to reach (63.6%) of respondent are

more than 5 years' experience is convergence opinion, that lead the experience does not influence the study sample opinions towards the study fields.

Table (4.14): ANOVA test of the fields and their p-values for experience in the construction works

No.	Field	Means				Test Value	Sig.
		Less than 3 years	From 3 to less than 5 years	From 5 to less than 10 years	More than 10		
1.	The current situation of labor management in construction project	3.06	3.00	2.92	3.13	0.831	0.480
	Factor related to labor	3.13	3.04	3.01	2.94	0.902	0.444
	Factors related to company's management	3.26	3.09	2.98	3.21	0.822	0.485
	Factors related to project nature	3.04	3.10	3.02	3.00	0.169	0.917
2.	Factor affecting in labor management practice to achieve high project quality	3.15	3.07	3.00	3.05	0.506	0.679
3.	Barriers that face implementing labor management in contracting company	3.03	3.04	3.00	2.95	0.091	0.965
4.	The best labor management activities to enhance quality during project construction	3.32	3.24	2.97	3.34	0.731	0.536
	All items of the questionnaire	3.14	3.09	2.98	3.10	0.549	0.650

4.6.5.3 Company Classification Class

Table (4.15) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the field “Factors related to project nature”, then there is significant difference among the respondents toward their field due to company classification

class. It is concluded that the company classification class has an effect on this field. This reflects the different methods of managing workers according to the nature of the project, its complexities and the equipment used in it.

For the other fields, the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$, then there is insignificant difference among the respondents toward these fields due to company classification class. It is concluded that the company classification class has no effect on the other fields. This refer to the convergence of the factors affecting the workers to the small geographical area in the Gaza Strip.

Table (4.15): ANOVA test of the fields and their p-values for company classification class

No.	Field	Means			Test Value	Sig.
		First class	Second class	Third class		
1.	The current situation of labor management in construction project	3.04	2.95	3.16	0.642	0.529
	Factor related to labor	3.07	2.99	2.99	0.396	0.674
	Factors related to company's management	3.20	2.97	3.22	1.038	0.359
	Factors related to project nature	3.11	2.83	3.14	4.509	0.014
2.	Factor affecting in labor management practice to achieve high project quality	3.12	2.95	3.10	1.420	0.247
3.	Barriers that face implementing labor management in contracting company	3.07	2.85	3.07	1.398	0.253
4.	The best labor management activities to enhance quality during project construction	3.38	2.86	3.00	2.538	0.085
	All items of the questionnaire	3.15	2.91	3.09	2.317	0.105

4.6.5.4 Company Experience in the Construction Industry

Table (4.16) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for each field, then there is insignificant difference among the respondents toward each field due to company experience in the construction industry. It is concluded that the company experience in the construction industry has no effect on each field. These results refers to that contractors who works in construction industry in Gaza Strip have a closely opinions and viewpoints about the subject of the research which mainly aimed to achieve high projects quality .

Table (4.16): ANOVA test of the fields and their p-values for company experience in the construction industry

No.	Field	Means				Test Value	Sig.
		Less than 3years	From 3 to less than 5 years	From 5 to less than 10 years	More than 10		
1.	The current situation of labor management in construction project	3.15	2.94	2.92	3.08	1.006	0.394
	Factor related to labor	3.10	3.04	3.02	3.03	0.089	0.966
	Factors related to company's management	3.07	3.09	3.04	3.22	0.429	0.733
	Factors related to project nature	2.92	3.09	2.97	3.08	0.606	0.613
2.	Factor affecting in labor management practice to achieve high project quality	3.05	3.07	3.02	3.11	0.236	0.871
3.	Barriers that face implementing labor management in contracting company	2.89	3.16	2.98	3.01	0.376	0.771
4.	The best labor management activities to enhance quality during project construction	2.83	3.01	3.17	3.34	0.767	0.515
	All items of the questionnaire	2.99	3.05	3.02	3.13	0.373	0.773

4.6.6.5 Company Size

Table (4.17) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for each field, then there is insignificant difference among the respondents toward each field due to company size. It is concluded that the company size has no effect on each field.

Table (4.17): ANOVA test of the fields and their p-values for company size

No	Field	Means				Test Value	Sig.
		Less than 10	From 11 to 30	From 31 to 50	More than 50		
1.	The current situation of labor management in construction project	2.99	3.01	3.04	3.05	0.054	0.984
	Factor related to labor	2.99	3.06	2.92	3.15	1.054	0.373
	Factors related to company's management	2.95	3.16	2.94	3.44	1.863	0.142
	Factors related to project nature	3.07	3.04	2.90	3.12	0.791	0.502
2.	Factor affecting in labor management practice to achieve high project quality	2.99	3.09	2.92	3.24	1.539	0.210
3.	Barriers that face implementing labor management in contracting company	3.06	3.04	2.87	3.03	0.387	0.763
4.	The best labor management activities to enhance quality during project construction	2.99	3.17	2.98	3.69	1.775	0.158
	All items of the questionnaire	3.01	3.08	2.94	3.25	1.231	0.304

4.6.5.6 Types of Implemented Projects Through Yours Company

Table (4.18) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the fields “Factors related to company's management, Factors related to project nature, Factor affecting in labor management practice to achieve high project quality and The best labor management activities to enhance quality during project construction”, then there is significant difference among the respondents toward these fields due types of implemented projects. It is concluded that the types of implemented projects has an effect on these fields. This result refer that the infrastructure project is lowest rank than other type, It linked with worker's instability in

construction site and there high mobility. It could be noted that electric and mechanic type have a highest rank but it not significant because it is very small percent from respondent (2.3 %). For the other fields, the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$, then there is insignificant difference among the respondents toward these fields due to types of implemented projects. It is concluded that the types of implemented projects has no effect on the other fields. This indicted that most barrier face labor management is similar to some extent in most construction projects.

Table (4.18): ANOVA test of the fields and their p-values for types of implemented projects

No.	Field	Means				Test Value	Sig.
		Resid - ential	Infrast - ructur e	Public buildin gs	Electric and Mechanic		
1.	The current situation of labor management in construction project	3.11	2.99	2.91	3.65	2.074	0.110
	Factor related to labor	3.10	2.97	3.05	3.31	0.794	0.500
	Factors related to company's management	3.26	2.86	3.34	3.85	3.866	0.012
	Factors related to project nature	3.17	2.88	3.08	3.36	3.133	0.030
2.	Factor affecting in labor management practice to achieve high project quality	3.17	2.92	3.16	3.50	2.919	0.039
3.	Barriers that face implementing labor management in contracting company	3.09	2.91	3.02	3.47	0.972	0.410
4.	The best labor management activities to enhance quality during project construction	3.50	2.75	3.49	3.87	4.423	0.006
	All items of the questionnaire	3.20	2.90	3.15	3.59	3.560	0.018

3.6.5.7 Number of Executed Projects in the Last Five Years by Your Company

Table (4.19) shows that the p-value (Sig.) is smaller than the level of significance $\alpha = 0.05$ for the field “Factor related to labor”, then there is significant difference among the respondents toward their field due to number of executed projects in the last five years. It is concluded that the number of executed projects in the last five years has an effect on this field. It is noted that the less than 10 project have high rank whereas interpret that the labors tends to simple tasks and smooth controlling, which is available in this category of project .

For the other fields, the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$, then there is insignificant difference among the respondents toward these fields due to number of executed projects in the last five years. It is concluded that the number of executed projects in the last five years has no effect on the other fields.

Table (4.19): ANOVA test of the fields and their p-values for number of executed projects in the last five years

No.	Field	Means				Test Value	Sig.
		10 projects or less	11-20 projects	21-30 projects	More than 30		
1.	The current situation of labor management in construction project	2.78	3.03	3.11	3.12	2.012	0.118
	Factor related to labor	3.24	3.05	2.88	3.06	2.725	0.049
	Factors related to company's management	3.26	3.16	3.01	3.18	0.470	0.704
	Factors related to project nature	3.20	3.02	2.91	3.12	1.756	0.162
2.	Factor affecting in labor management practice to achieve high project quality	3.23	3.08	2.93	3.11	1.562	0.205
3.	Barriers that face implementing labor management in contracting company	3.23	2.97	2.90	3.06	1.144	0.336
4.	The best labor management activities to enhance quality during project construction	3.34	3.17	3.08	3.36	0.327	0.806
	All items of the questionnaire	3.17	3.06	2.98	3.15	0.634	0.595

3.6.5.8 Total Value of Executed Projects During the Last Five Years

Table (4.20) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for each field, then there is in significant difference among the respondents toward each field due to total value of executed projects during the last five years. It is concluded that the total value of executed projects during the last five years has no effect on each field. This result reflect that most of project is convergence in management methods moreover most of Gaza project is moderate size .

Table (4.20): ANOVA test of the fields and their p-values for total value of executed projects during the last five years

No	Field	Means				Test Value	Sig.
		Less than 1	From 1 to less than 2	From 2 to 5	More than 5		
1.	The current situation of labor management in construction project	3.01	3.14	3.03	2.95	0.565	0.639
	Factor related to labor	2.93	3.01	3.04	3.08	0.323	0.809
	Factors related to company's management	2.88	3.04	3.05	3.35	1.637	0.187
	Factors related to project nature	2.95	3.01	2.95	3.15	1.337	0.268
2.	Factor affecting in labor management practice to achieve high project quality	2.92	3.02	3.02	3.19	1.222	0.307
3.	Barriers that face implementing labor management in contracting company	2.96	2.84	3.00	3.12	0.848	0.471
4.	The best labor management activities to enhance quality during project construction	2.88	3.00	3.10	3.49	1.466	0.230
	All items of the questionnaire	2.93	3.00	3.03	3.19	1.052	0.374

4.6.5.9 Number of Permanent Worker in Company

Table (4.21) shows that the p-value (Sig.) is greater than the level of significance $\alpha = 0.05$ for each field, then there is in significant difference among the respondents

toward each field due to number of permanent worker in company. It is concluded that the number of permanent worker in company has no effect on each field. This result emphasize the dependent of contracting company in Gaza Strip on subcontractor and hiring worker while not depending on permanent worker.

Table (4.21): ANOVA test of the fields and their p-values for number of permanent worker in company

No.	Field	Means				Test Value	Sig.
		10 persons or less	11-20 persons	21-30 persons	More than 30 persons		
1.	The current situation of labor management in construction project	2.96	3.02	3.21	3.20	0.820	0.487
	Factor related to labor	3.08	2.98	3.02	3.14	0.523	0.668
	Factors related to company's management	3.09	3.21	2.93	3.20	0.381	0.767
	Factors related to project nature	3.06	3.03	2.78	3.20	1.174	0.325
2.	Factor affecting in labor management practice to achieve high project quality	3.08	3.07	2.93	3.17	0.302	0.824
3.	Barriers that face implementing labor management in contracting company	3.04	3.02	2.79	3.00	0.375	0.771
4.	The best labor management activities to enhance quality during project construction	3.16	3.21	3.21	3.43	0.104	0.958
	All items of the questionnaire	3.07	3.08	3.00	3.19	0.144	0.933

Chapter (5)

Case Study

Chapter 5

Case Study

This chapter is a case study, which is a research method involving an up-close, in-depth, and detailed examination of the subject of study, as well as its related contextual conditions. This chapter included information about the case study design, frame work, data collection and case study questions. Case studies are implemented in two existing projects to stand on the reality of the labor management practice and its impact on projects quality in the Gaza Strip.

5.1 Introduction

Yin (2013) defines case study as ‘an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context especially when the boundaries between phenomenon and context are not clearly evident’. There are three types of purpose behind case studies research: exploratory case studies, descriptive case studies, and explanatory case studies (Naoum, 2012). The choices will depend on the research question (Yin, 2013). In this context, this research involves the exploratory ‘what’ questions. Thus, this research moves towards the exploratory case studies. Exploratory research is a valuable means of finding out ‘what is happening, to seek new insights, to ask questions and to assess phenomena in a new light’ (Robson & McCartan, 2016).

Indeed, the case study requires multiple sources of evidence, such as documents, archival records, interviews, and direct observations. This study adopted a case study methodology which implemented in two existing project to enforce the questionnaire result with the real world. It examine and discuss the effect of labor management by contracting companies on project quality in the Gaza Strip. "Construction of commercial and administrative buildings" and "Rehabilitation of al-Shuhada Street" were chosen as a two projects to implement a case study. It located in Deir El Balah city in the middle of Gaza Strip. An interviews and multiple field visits to the department of construction projects, as well as the adoption of the documents and records to collect data and information required.

5.2 Case Study Design

The term case study refers to both a method of analysis and a specific research design for examining a problem, both of which are used in most circumstances to generalize across populations. A case study encompasses a problem contextualized around the application of in-depth analysis, interpretation, and discussion, often resulting in specific recommendations for action or for improving existing conditions.

According to Yin (2013), there are four types of basic design of case study research as can be seen in the 2x2 matrix in Figure (5.1). The selection is based on whether the research is single or multiple-case studies and whether it is holistic (single unit of analysis) or embedded (multiple units of analysis). In designing case studies, the primary distinction is between single-case and multiple-case design. A single case study is justifiable when the study represents a critical case, extreme or unique circumstances, a representative or typical case, a revelatory case, or a longitudinal case (Yin, 2013). The research about the effect of labor management by contracting company in project quality does not meet the above criteria, so this study implements the multiple-case design. Multiple-case studies have distinct advantages and disadvantages compared to single-case design. It is more compelling and therefore is more robust also allows replication logic and increases the breadth of the study (Yin, 2013). The disadvantage of the case study method is that it requires more resources and is more time consuming. Yin (2013) stated that the protocol is essential in a multiple-case study. The protocol should include the following sections:

- An overview of the case study project - this will include project objectives, case study issues, and presentations about the topic under study.
- Field procedures - reminders about procedures, credentials for access to data sources, location of those sources.
- Case study questions - the questions that the investigator must keep in mind during data collection.
- A guide for the case study report - the outline and format for the report.

An investigating and writing up of a case study requires to practice applying knowledge and thinking skills to a real situation and will require the completion of specific stages. Every case study report should include a concluding statements on the subject of the report. It advised to restate the aim of the report and state how it have achieved also could be present the main findings and key recommendations in a summarized form. As well as should restate the limitations of the report .

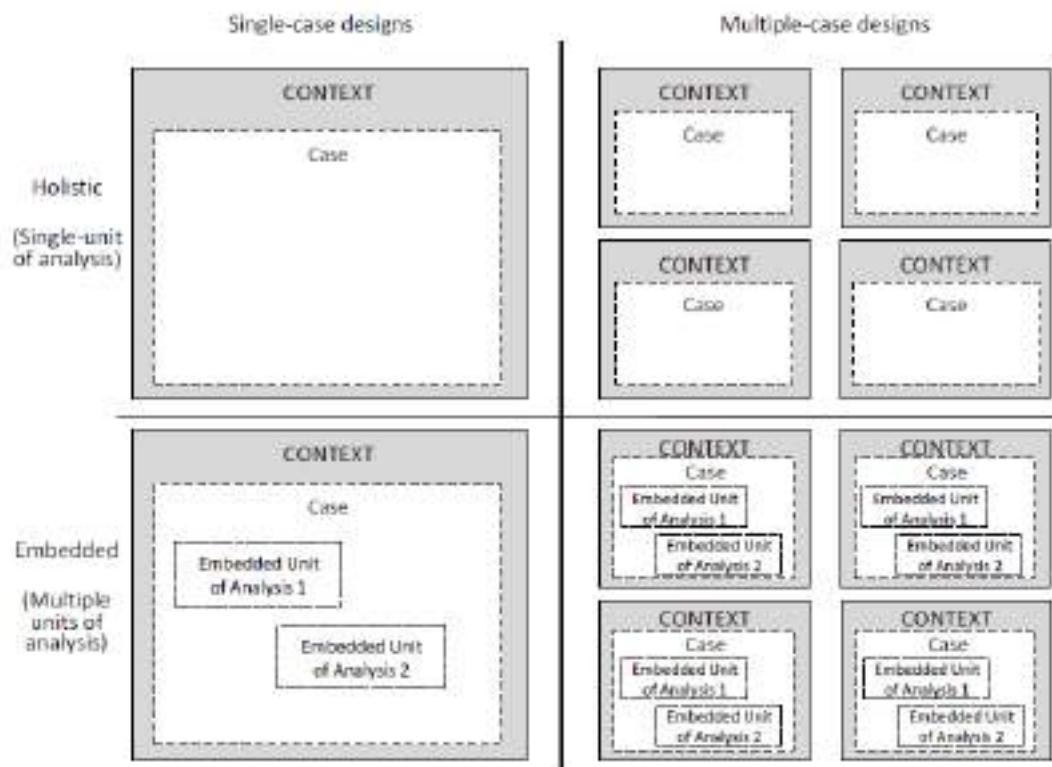


Figure (5.1): Basic types of designs for case studies (source: Yin, 2013)

5.3 Case Study Framework

Baxter and Jack (2008) noted that the conceptual framework serves several purposes: (a) identifying who will and will not be included in the study; (b) describing what relationships may be present based on logic, theory and/or experience; and (c) providing the researcher with the opportunity to gather general constructs into intellectual “bins”.

Figure (5.2) shows the frame work of the case study and the items that should be involved in the study of labor management practice and which applicate by contactors to achieve high quality in construction projects .

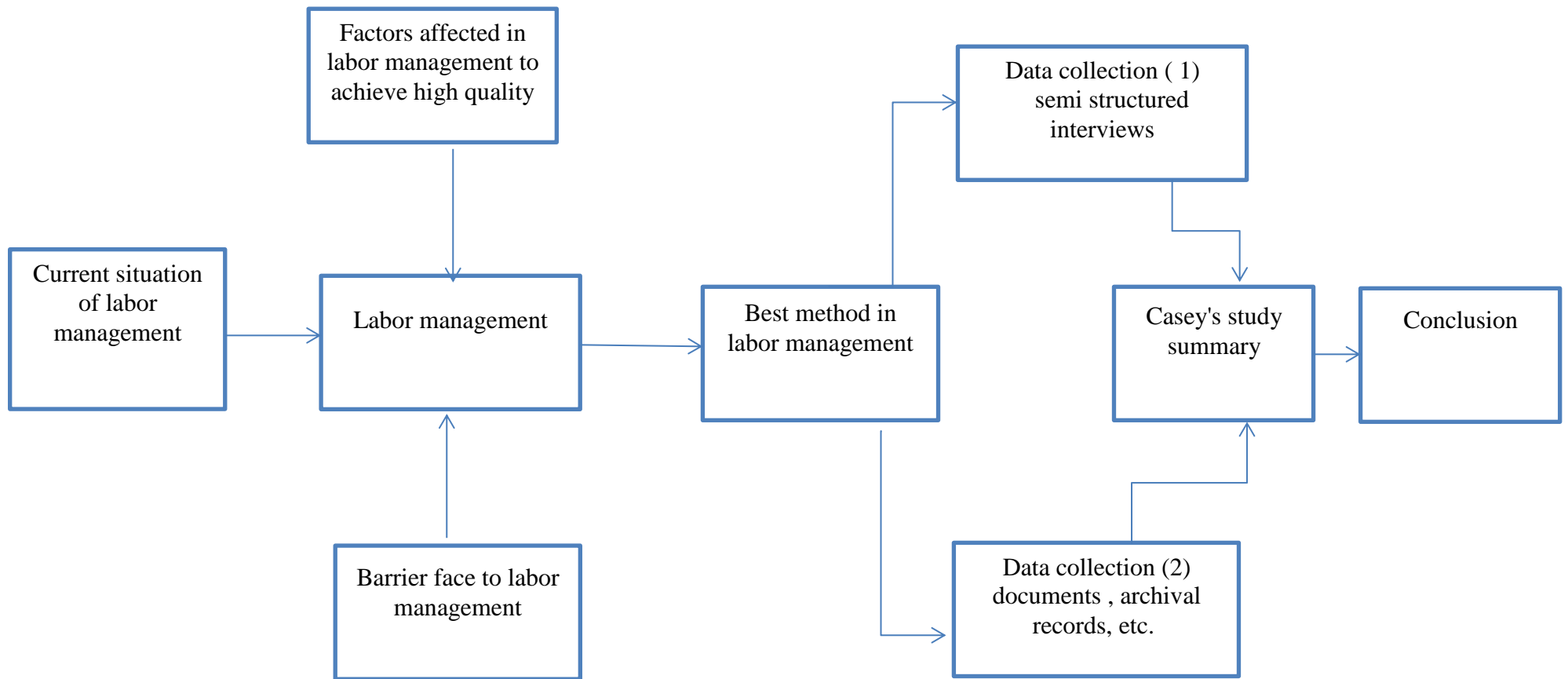


Figure (5.2): Case Study Framework

5.4 Case Study (1): " Construction of Commercial and Administrative Buildings "

To enforce the questionnaire result with the real world, Construction of commercial and administrative buildings was chosen to applicate a case study. From documentation, archival records, interviews, and direct observation we reached to:

5.4.1 Background of the Project

Construction of commercial and administrative buildings is a residential building located in Deir El Balah city in the middle of Gaza Strip. It designed to use for rent. The scope is to benefit from it's financial return to the Deir El Balah municipality and provide offices for community institutions and organizations. It consisting of five floors in addition to ground floor. The ground floor consist of 5 stores and behind it a hall, also every floor is divided into 4 flats. Table (5.1) and Figure (5.3) show the more details about the project.

Table (5.1): Building Background

No	Item	Details
1	Building name	Al-Helal building
2	Building owner	Municipality of Deir El Balah
3	Area	475 m ²
4	Site	Gaza Strip / Deir El Balah
5	Fund	The Municipal Development and Lending Fund (MDLF)
6	Contractor	Al-Fajer Aljadeed for Engineering & Contracting
7	Contractor classified	Second class
8	No. of worker	40 worker
9	Cost	800,000 \$
10	Commencement date	1/5/2016
11	Delivery date	29/12/2016
12	Building aim	It used for rent to benefit from it's financial return to the Deir El Balah municipality and provide offices for community institutions and organizations



Figure (5.3): Location of case study in Deir El Balah city

The project manager, site engineer, and supervisor of owner of the building (Municipality of Deir El Balah) were communicated by visiting in order to get all project documentation, drawings, cost estimate, bill of quantity, and administrative report as well as respond to all inquiries precisely. Table (5.2) shows the background of the case study participants.

Table (5.2): Background of the case study participants

Specialization	Position	Experience	No. of interview
Civil engineer	Projects manger	10 years	2
Civil engineer	Site manager (supervisor)	8 years	1
Architect	Site manager	7 years	2

5.4.2 Case Study Questions

In this study, there are several "what" questions. The type of research question and the extent of control an investigator has over actual behavioral events justifies an exploratory study. This research questions is:

- 1) What are the current situation and levels of application of labor management practice in local contracting companies?
- 2) What are the factors that affecting on the labor management practice in construction projects to achieve high quality ?
- 3) What are the barriers that prohibiting local contractor to adopt labor management in their construction activities?
- 4) What are the best ways in labor management to have high quality in projects construction?

It should be noted that all case study information was obtained by the case study participants. Table (5.3) show the case study questions.

Table (5.3): Al Helal building case study questions

No	Question	Comments
1	What are the current situation and levels of application of labor management practice in local contracting companies?	<ul style="list-style-type: none"> ▪ In general, the performance of workers in this project is classified as the moderate productivity. ▪ Company is a highly dependent at subcontractors because of different task and there are a few of permanent workers in the company. ▪ There are highly skilled workers, but their wages are high. ▪ The relationship and communication between workers can be classified as a good. ▪ Good labor management practices are applied in aspects and are not applied in other respects in this project. ▪ There is a kind relationship between management and labor in the project.

2	<p>What are the factors that affecting on labor management practice in construction projects to achieve high quality?</p>	<ul style="list-style-type: none"> ▪ The efficiency of the worker is one of the most important factors affecting the quality of this project. ▪ Labor wages is a focal point in the influencing at quality of the project as it contributes to the satisfaction of the employee ▪ The mechanism of selection of the worker, and the terms of his contract is one of the most important issues related to project quality, so in this project we depend in lump sum contract. ▪ The experience of the management team has been a strong factor in obtaining the quality of the project and facilities a lot of tasks. ▪ Negatively economic conditions of life which the worker lives are important in a workers Psychological whose motivation to work was negatively influenced by it.
3	<p>What are the barriers that prohibiting local contractor to adopt labor management in their construction activities?</p>	<ul style="list-style-type: none"> ▪ The political situation is one of the main obstacles, where the work was stopped several times due to the closure of the crossings and the lack of necessary materials. ▪ The workers were not well motivated during the project. ▪ The overcrowding of workers at the workplace has had an impact on some aspects of the quality of the project. ▪ The absence of workers from the work site and lack of daily discipline led to the

		<p>delay in the delivery of the project.</p> <ul style="list-style-type: none"> ▪ There is no approved system for the management of workers because of the small projects and frequent mobility and lack of stability of workers.
4	<p>What are the best ways in labor management to have high quality in projects construction?</p>	<ul style="list-style-type: none"> ▪ Paying the wages on time is one of the most prominent methods that have been followed in the management of workers. ▪ Good planning and task management and scheduling in a way that invests all the energies in the work site. ▪ Meeting the challenges and overcoming the obstacles facing the workers in the working site. ▪ Monitor the performance of workers, and good follow-up leads to saving time, effort and money. ▪ Try to achieve a kind of cooperation and fraternal emotions between staff and management.

5.5 Case Study (2): " Rehabilitation of Al-Shuhada Street "

To enforce the questionnaire result with the real world, " Rehabilitation of al-Shuhada Street " was chosen to applicate a case study. From documentation, archival records, interviews, and direct observation we reached to:

5.5.1 Project Background

The project manager, site engineer, and supervisor of owner of the building (Municipality of Deir El Balah) were communicated by visiting in order to get all project documentation, drawings, cost estimate, bill of quantity, and administrative report as well as respond to all inquiries precisely. Table (5.4) shows the background of the case study participants.

Al-Shohadaa Street is located in Deir El Balah city in the middle of Gaza Strip. It is the main road in the city and connected between the west and the east of the city. It funded by The Municipal Development and Lending Fund (MDLF). This project divided in two stage and aims to improve service to the people, and mobility with ease, and facilitate traffic. A lot of tasks and activities are included in this project. Table (5.5) show more information about Al-Shuhada street project.

Table (5.4): Background of the case study participants

Specialization	Position	Experience	No. of interview
Civil engineer	Projects manger	12 years	2
Civil engineer	Site manager	10 years	1
Civil engineer	Site manager (supervisor)	9 years	2

Table (5.5): Project Background

No	Item	Details
1	Building name	Rehabilitation of Al-Shuhada street
2	Building owner	Municipality of Deir El Balah
3	Area	19500 km ²
4	Site	Gaza Strip / Deir El Balah
5	Fund	The Municipal Development and Lending Fund (MDLF)
6	Contractor	Al-Gaaowd for General Trading & Contracting
7	Contractor classified	First class
8	No. of worker	18 workers
9	Cost	920,000 \$ (two stages)
10	Commencement date	11/9/2017
11	Delivery date	1/2/2017
12	Building aim	Rehabilitation of Shuhada Street so as to provide a good service to the population, and mobility with ease, and facilitate traffic

5.5.2 Al-Shohadaa Street Case Study Questions

To stand up on the reality of labor mangment by the contractor that executive this project and explain its effect on project quality, Table (5.6) show the answer of case study questions.

Table (5.6): "Al-Shohadaa Street" case study questions

No	Question	details
1	<p>What are the current situation and levels of application of labor management practice in local contracting companies?</p>	<ul style="list-style-type: none"> ▪ The company has a program for worker health and safety site to avoid any accident or injuries. ▪ Not all of labor management principles are appointed in construction site so There is a gap between knowledge and application in labor management. ▪ The wages of workers in the project do not represent a large proportion of project costs, because most costs are in raw materials. ▪ The performance of workers in this project is classified as the moderate productivity. ▪ Labor is disciplined at the workplace, and there is an administrative system that is committed to everyone, which affects the achievement and project quality in general. ▪ The company relies on motivating workers from time to time, which increases their motivation to work and. ▪ The company depend on its permanent workers and subcontractors are used in some tasks. ▪ The management of the company transact the workers in a gentle manner, and there

		<p>is an understanding between the management staff and the workers within the framework of the general law of the company, in a manner that does not conflict with the business interest.</p>
<p>2</p>	<p>What are the factors that affecting on labor management practice in construction projects to achieve high quality?</p>	<ul style="list-style-type: none"> ▪ The mutual trust between the management and labor reflect a good situation and motivation labor to work which enhance the projects performance and quality. ▪ The efficiency of the worker is one of the most important factors affecting at quality of this project. ▪ Amount of contractors cash flow, is crucial factor in sequences of the work. ▪ The mechanism of selection of the worker, and the terms of his contract is one of the most important issues related to project quality, so in this project we depend in two approach (lump sum and daily wages). ▪ The experience of the management team has been a strong factor in obtaining the quality of the project and facilities a lot of tasks. ▪ Negatively economic conditions of life which the worker lives are important in a workers Psychological whose motivation to work was negatively influenced by it. ▪ Taking the reputation of the company into consideration create a constraints of the workers' commitment to their work.

3	<p>What are the barriers that prohibiting local contractor to adopt labor management in their construction activities?</p>	<ul style="list-style-type: none"> ▪ The political situation is one of the main obstacles, where the work was stopped several times due to the closure of the crossings and the lack of necessary materials. ▪ The frequent mobility of construction workers has adversely affected the quality of work. ▪ Fragmentation of the construction process such as increased industry parties and divided processes has a significant role in prohibiting satisfying in the work furthermore affected to quality of projects. ▪ There is no strategy to train workers on modern machines or new equipment, thus saving time and effort. ▪ If there is an inefficient management of the project, this may be the main reason for the negative impact on quality, where the general goal will be missed, and there not will be someone who guides the work.
4	<p>What are the best ways in labor management to have high quality in projects construction?</p>	<ul style="list-style-type: none"> ▪ Paying the wages on time is one of the most prominent methods that have been followed in the management of workers. ▪ Good planning and task management and scheduling in a way that invests all the energies in the work site. ▪ Meeting the challenges and overcoming the obstacles facing the workers in the working site. ▪ Monitor the performance of workers, and good follow-up leads to saving time,

	<p>What are the best ways in labor management to have high quality in projects construction?</p>	<p>effort and money.</p> <ul style="list-style-type: none"> ▪ Go ahead to achieve a kind of cooperation and fraternal emotions between staff and management. ▪ use machine and automated system it can save money, time and resources. ▪ Motivate and training the worker lead to high productivity in working site and enhance the quality of projects.
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5.6 Case Study's Summary

The case studies of "Construction of commercial and administrative buildings" and "Rehabilitation of al-Shuhada Street" was developed to investigate the effect of the labor management by contracting company on project quality in the Gaza Strip. Hence, a theoretical and practical benefits were concluded. The case studies reflect both the current situation of labor management and the factor which affected it as well as gathered a main factors which barrier to implementing a good labor management practice. In addition to that it concluded the best methods in labor management in contracting companies which can improve the project management also reduce time and cost and through it enhance the project quality.

The case study was a real application of the results of the questionnaire obtained in the previous chapter. It could be noted that there is a highly agreement between the results of the case study and the results of the questionnaire. Some minor differences may be due to differences in the nature of the project and the difference of the relative view of people to some factors. It is too small to be neglected or irrelevant. This agreement in the result, strengthens and confirms the study accuracy and reality.

Chapter (6)

Conclusion and Recommendations

Chapter 6

Conclusion and Recommendations

This chapter summarizes the research and aims to provide recommendations and conclusion for the effect of labor management by contracting companies on projects quality in the Gaza Strip and suggests areas of future research as a result of the findings. By revisiting the research objectives and key findings, an overview is critically discussed to assess the extent to which the research objectives were met.

6.1 Summary of the Research

An investigation into the current situation, factors, barriers and best method that affected labor management by contracting company to enhance project quality in the Gaza Strip. An extensive review of literature was conducted to achieve the aim of the study. The aim of the research is to provide guidelines for effective management methods that enhance project quality in contracting company. The results of a 88 collected comprehensive questionnaires were analyzed quantitatively. These data was organized and analyzed using SPSS software version 24. To satisfy this study objectives, two stages of data analysis were processed. The first stage consisted of some techniques of descriptive and inferential statistics involving mainly, Mean Score (MS) and Relative Importance Index (RII) to put the study statement\variables in order format. In addition, qualitative survey was conducted using a case study for two projects of "Construction of commercial and administrative buildings" and "Rehabilitation of al-Shuhada Street" to enforce the questionnaire result with the real world. The findings are then investigated and interpreted to provide recommendations for improving the labor management practices and its effect on project quality for construction industry in Gaza Strip.

6.2 Conclusions of the Research Objectives and Questions

In achieving the aim of the research, four main objectives have been outlined and achieved through the findings of the analyzed collected questionnaires. These objectives are related with the research questions that were developed to increase

one's knowledge and familiarity with the subject. The outcomes were found and divided by research objectives as following:

6.2.1 Outcomes Related to Objective One

- The objective was: *To assess the current situation of labor management in contracting companies. This objective is related with the following research question:*
- The first research question: What are the current situation and levels of application of labor management practice in local contracting companies?

The study findings related to this issue can be concluded as the current situation of labor management in the construction companies in the Gaza Strip suffers from several important issues, the productivity of workers at a low level, and there is no specific strategy used by construction companies to managing workers moreover that the company not regularly assessing to all legal obligations related to labors so it's located in latest rating.

On the other hand, it is noted that there is good communication between the workers in the company, and the methodology of training and motivating the workers is not in the required degree by the management of companies. In addition, companies gives priority for safety and health in the workplace.

It is generally noted that the reality of the management of workers needs to be developed in many factors and aspects, where it has been shown that there is a gap between theory and practice.

6.2.2 Outcomes Related to Objective Two

- The objective was: *To study the factors affecting on the performance of labors and its relationship with projects quality. This objective is related with the following research question:*
- The second research question: What are the factors that affecting on the labor management practice in construction projects to achieve high quality ?

The finding indicted that the factors were linked to the company's management come in the first location rather than factor related to labor as well as the factors related to project nature. The research showed that the fair contract with the workers and the effectiveness and competences of the administrative staff of the company is one of

the most important factors related to the management of the company. A bout factors related to labor, workers skills, efficiency, mutual trust between them and the administration are the most important factors. In addition site condition, weather and design change are the most important factors associated with the nature of the project.

On the other hand, role of labors union, continuation of work and follow-up, turnover of workers between jobs, and the short-term vision of company are the most important factors that have low level effective degree on the management of workers.

Through this field, it is concluded that the identifying the most important factors that must be taken into consideration by the construction companies in the management of their workers to reach the best quality of the projects implemented.

6.2.3 Outcomes Related to Objective Three

- The objective was: To identify the barriers face labor management in contracting companies. This objective is related with the following research question:
- The third research question: What are the barriers that prohibiting local contractor to adopt labor management in their construction activities?

The study findings demonstrated that labor management barriers are greatly affecting the achieving high construction project's quality in the Gaza Strip. The top barriers for labor management practice, which got top ranking according to overall respondents are as follow: (1) in effective management, (2) fragmentation of construction process, and (3) instability of political condition.

Results also obtained that problem related to women and new technology which required special skills is lowest rank in obstacle labor management in contracting company in Gaza Strip.

6.2.4 Outcomes Related to Objective Four

- The objective was: To identify the most effective methods of managing labors to achieve good quality. This objective is related with the following research question:
- The forth research question What are the best methods in labor management to have high quality in projects construction?

The study findings indicated that the best labor management methods is significantly important to achieve high project quality. Labor management methods that got top ranking according to overall respondents are as follow: (1) maintain work discipline, (2) on time payment to the worker, (3) use automated system and new technology, and (4) motivate and facility to worker. According to respondent, the majority of item which discussed in previous chapter related to best labor management methods field, It could be concluded that are very useful item to get the best strategies for managing workers.

6.3 Research Value

This study contents, methods used and findings making it to be considered as one of the most significant studies about labors issues in local construction sector. The value of this study can be shown in the following points

- This study presents the first investigation into labors management aspects in local construction industry, especially its effect in project quality.
- This study results will open the door for more discussion about all subjects related to labors recruited methods, productivity and motivation in construction.
- The results of this study can be of immense benefit to policy makers and construction industry practitioners (clients, contractors and consultants) and academicians.
- Other practitioners and researchers can benefit from this study findings because this study data collection and questionnaire was established on the basis of an extensive literature review of several researches. However, it should be noted that this instrument is more valid for construction industry rather than other industries.

6.4 Future Research

There are many possibilities for further research in this content because it is an important approach in construction industry. This study has thrown up many questions in need for further investigation. It is recommended that further research be undertaken in the following areas:

- Problems and berries of labor in constructions need to be researched, through in-depth case studies or action research.
- There is a need for much more in-depth financial analysis of the costs associated with labor management strictly from a contractor's perspective.
- The results of this study suggested the need for to modern labor management efficient methods. So that, it will allow for future research focused on developing further and validating the best methods and technologies for labor management engagement in construction. Effectiveness of these activities and how it can be implemented should be studied.
- Studying the role of the labor union, and its impact on workers' rights and the performance of projects.
- Studying the effect of construction's labors management at project quality from labor's perspective.

6.5 Limitations

The researcher appreciate the limitations in this study. The followings are the major limitations related to this research:

- To obtain more consistent results, this study focused on the first three classes of local contracting companies.
- This research findings refer to Gaza Strip context, though labor management are widely used in many other developing countries.
- This study focused only on the perception of projects managers and site engineers who have extensive experience to attain a valuable suggestions and understandings from local construction sector.
- The questionnaire is somewhat limited, for the sample size is small and it is the summary of opinions towards the importance of predetermined factors.

- This research focuses on identifying the labor management strategies implemented by contracting firms only. It is conceivable that investigating to other industry members such as labor's perspective might provide different results.

6.6 Recommendations

Based on the achieved objectives of this research as stated earlier, the recommendations below were drawn as a result of the research findings. To reach to the best method in labor management practice and to achieve high quality in construction project, The recommendations are as follow:

- Obligation by the contracting companies to pay a fair salary to the labors on time, which core with employee's satisfaction and improves productivity.
- Follow-up by contracting companies to discipline labors at work sites, and non-absenteeism from work, lead to completion of work in specific time, and improve performance in general.
- Contracting companies should develops the relationship between its management staff and labors and enhance mutual trust between them, which is beneficial to both parties.
- Contracting company should make a fair contractual condition of labors to confirm the rights of them. and choose the best way to fit in the contract, which has positive effects on the psyche of the worker and thus on their productivity.
- Construction companies must adopt a methodology to motivate workers in the workplace with all kinds of incentives such as financial rewards and salary increases, which increases loyalty and faithfulness to work.
- Develop a program to training labors in the different areas they need in the workplace and work to provide them with the required skills, especially in dealing with modern and electronic equipment, which saves time, effort and money.
- Contracting companies required to introduce proper tools to monitor the performance of labors in the company and guidance to direct instructions and

orders required to maintain the interest of the work, which is reflected positively on the quality of the projects.

- The management of contracting companies should appoint to schedule tasks and clarify responsibilities related to labors in addition to refining the site planning where it avoided overcrowded of labors in the workplace and enhances the quality of the project.
- Contracting companies must set up a training program to develop their administrative staff which included engineers supervising the workers and providing them with the necessary skills, which entitles them to gain the love and loyalty of the workers.
- The management of contracting companies should work to provide a facilities for workers and delegate some of the responsibilities to them in order to motivate them and have a high quality.
- Establish a specific program to recruit workers as well as the necessity of selection based on professional competence. It is a direct and major recommendation to achieve high quality of the project.
- Consideration the negative conditions and social dimensions related to workers and understand their living situation, which makes the worker senses about self's important and become more faithful to his company, which is reflected a positive indirectly relation on the quality of the project.
- Increase the safety and health procedures related to the workers in the worksite and train the workers to use and adhere it in order to preserve their lives and avoid the negative damage which will caused.
- Activating the role of the labors union to follow up labors rights and work to adopt service and facility of workers in construction sector.
- Increase scientific research and studies related to this subject since it is very important and significant issue. In addition to that quality in the modern time is a requirement for all companies, and it is the main field of competition between contracting companies.

As follow in figure (6.1), A framework of labor management practice to achieve high quality of construction projects in the Gaza Strip:

Contracting companies should adopted this strategies in labor management practice to enhance quality of construction projects.

- Enhance mutual trust between labor and managers.
- A fair contractual condition of labors.
- A specific program to recruit workers.
- Assessing the compliance to all legal obligations related to labor

- Discipline labors at work sites.
- Adopt a methodology to motivate workers.
- Develop a program to training labors.
- Provide a facilities for workers and delegate some of the responsibilities

- Pay a fair salary to the labors on time.
- Monitor the performance of labors.
- Schedule tasks and clarify responsibilities of labor.
- Advance site layout

- A training program to develop administrative staff.
- Activating the role of the labors union.
- Increase the safety and health procedures to workers.
- Consideration the negative conditions of worker.



Figure (6.1): Framework of effective labor management practice by contracting companies to achieve high quality in construction projects

References

Reference

- Al-Aamri, A. (2010). Employee Motivation in Private Organization. *Project and Employee Productivity on Performance of Commercial Banks in Kenya*” *African Journal of History and Culture*, 2(5).
- Amanuel, M. (2016). *a study on factors affecting labor productivity on building construction projects in addis ababa, Ethiopia*. Addis Ababa University.
- Asian Productivity Organization. (2014). *Manual on Labor-Management Relations: Japanese Experiences and Best Practices*. Japan
- Ashokkumar, D. (2014). Study of Quality Management in Construction Industry. *International Journal of Innovative Research in Science, Engineering and Technology*, 3(1), 36-43.
- Attar, A., Gupta, A., & Desai, D. (2012). A study of various factors affecting labour productivity and methods to improve it. *IOSR Journal of Mechanical and Civil Engineering*, 11-14.
- Baxter, P., & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The qualitative report*, 13(4), 544-559.
- Bourne, M., Neely, A., Platts, K., & Mills, J. (2002). The success and failure of performance measurement initiatives: Perceptions of participating managers. *International journal of operations & production management*, 22(11), 1288-1310.
- Bourque, L. (2003). *How to conduct self-administered and mail surveys* (Vol. 3): Sage.
- BusinessDictionary. (2017). labor dispute. BusinessDictionary.com Retrieved December 11, 2017, from <http://www.businessdictionary.com/definition/labor-dispute.html>
- Chan, A. P., & Tam, C. (2000). Factors affecting the quality of building projects in Hong Kong. *International Journal of Quality & Reliability Management*, 17(4/5), 423-442.
- Chand, S. (2014). Monetary and Non-Monetary Factors of Motivation. Retrieved novenmer 7,2017, from <http://www.yourarticlelibrary.com/motivation/monetary-and-non-monetary-factors-of-motivation/32391>

- Chapman, R., & Al-Khawaldeh, K. (2002). TQM and labour productivity in Jordanian industrial companies. *The TQM magazine*, 14(4), 248-262.
- Cole, G. (2002). Personal and human resource management 5th ed. *Tj international padstow Cornwall, London. Education Azare, Bauchi State, Nigeria Islam, N., Saha, GC (2001). Job Satisfaction of Bank Officers in Bangladesh. Bangladesh.*
- Cowherd, D. M., & Levine, D. I. (1992). Product quality and pay equity between lower-level employees and top management: An investigation of distributive justice theory. *Administrative Science Quarterly*, 302-320.
- Creative Research Systems, (2012) . Creative Research Systems. [Online], Available at: <http://www.surveysystem.com>.
- Dada, M. (2003). *Perceptions on Measures of Contracting/Contractor's Performances: A Lagos State Survey of Nigerian Indigenous Contractors*. Paper presented at the Proceedings of 1st International Conference on Global Construction 2003.
- Dainty, A., Moore, D., & Murray, M. (2007). *Communication in construction: Theory and practice*: Routledge.
- De Vaus, D. (2013). *Surveys in social research*: Routledge.
- Deery, S. J., & Iverson, R. D. (2005). Labor-management cooperation: Antecedents and impact on organizational performance. *ILR Review*, 58(4), 588-609.
- Dillman, D. (2000). Constructing the questionnaire. Mail and internet surveys. *New York*.
- Ding, D. Z., & Warner, M. (2001). China's labour-management system reforms: Breaking the 'Three Old Irons'(1978–1999). *Asia Pacific journal of management*, 18(3), 315-334.
- Ding, L., Kleiner, M. M., Leonard, J. S., & Pilarsk, A. M. (2013). The Influence on Resale Prices of Labor–Management Disputes in Aircraft Manufacturing. *LERA For Libraries*.
- Dunlop J.T. Industrial Relations System. New York: Holt; 1958.
- Ebisuno, S. (2013). Labor-management relations during high economic growth: Japanese-style labor-management relations.

- Enshassi, A., Al-Najjar, J., & Kumaraswamy, M. (2009). Delays and cost overruns in the construction projects in the Gaza Strip. *Journal of Financial Management of Property and Construction*, 14(2), 126-151.
- Enshassi, A., & Ayyash, A. (2014). Factors affecting cost contingency in the construction industry—Contractors' perspective. *International Journal of Construction Management*, 14(3), 191-208.
- Enshassi, A., Mohamed, S., Mustafa, Z. A., & Mayer, P. E. (2007). Factors affecting labour productivity in building projects in the Gaza Strip. *Journal of Civil Engineering and Management*, 13(4), 245-254.
- Fagbenle, O. I., Ogunde, A., & Owolabi, J. (2011). Factors affecting the performance of labour in Nigerian construction sites. *Mediterranean journal of social sciences*, 2(2), 251-257.
- Faizal, N. (2010). Construction Industry and its characteristics.
- Fellini, I., Ferro, A., & Fullin, G. (2007). Recruitment processes and labour mobility: the construction industry in Europe. *Work, employment and society*, 21(2), 277-298.
- Fellows, R. F., & Liu, A. M. (2015). *Research methods for construction*: John Wiley & Sons.
- Field, A. (2009). *Discovering statistics using SPSS*: Sage publications.
- Garson, G. (2013). Validity and Reliability (Statistical Associates Blue Book Series 12), Kindle Edition: USA: Statistical Associates Publishers.
- Ghauri, P. N., & Grønhaug, K. (2005). *Research methods in business studies: A practical guide*: Pearson Education.
- Gospel, H. F. (1986). Comparative Patterns of Labor-Management Relations: Great Britain, the US, and Japan. *Business and Economic History*, 119-131.
- Gundecha, M. M. (2013). Study of factors affecting labor productivity at a building construction project in the usa: web survey. *Circulation*, 701, 8888.
- Gupta, V., & Kansal, R. (2014). Improvement of Construction Labour Productivity in Chambal Region. *International Journal of Research in Engineering and Technology*, 3(10), 34-37.

- Hanif, F. (2013). Impact of training on employee's development and performance in hotel industry of lahore, pakistan. *Journal of business studies quarterly*, 4(4), 68.
- Harris, F., & McCaffer, R. (2013). *Modern construction management*: John Wiley & Sons.
- Heizer, J., & Render, B. (1990). *Production and Operations Management "Strategic and Tactical Decisions"* Prentice Hall: NJ.
- Hendrickson, C., & Au, T. (2000). *Project Management for Construction: Fundamental Concepts for Owners. Engineers, Architects and Builders*, Prentice Hall, Pittsburgh.
- Hendrickson, C., & Au, T. (2008). *Project management for construction: Fundamental concepts for owners, engineers, architects, and builders* (2 ed.): Chris Hendrickson.
- Hertzog, M. (2008). Considerations in determining sample size for pilot studies. *Research in nursing & health*, 31(2), 180-191.
- Husseini, A. (1991). *The importance of Manpower training and management to the construction industry*. Paper presented at the Proceedings of the National Seminar on Effective Contract Management in the Construction Industry.
- Jagero, N., Komba, H. V., & Mlingi, M. N. (2012). Relationship between on the Job Training and Employee's Performance in Courier Companies in Dar es Salaam, Tanzania. *International Journal of Humanities & Social Science*.
- Janipha, N. A. I., & Ismail, F. (2013). Conceptualisation of quality issues in Malaysian construction environment. *Procedia-Social and Behavioral Sciences*, 101, 53-61.
- Janssen, D., & Janssen, c. (2017). What does Labor Management System (LMS) mean? *Techopedia*.
- Kazaz, A., Manisali, E., & Ulubeyli, S. (2008). Effect of basic motivational factors on construction workforce productivity in Turkey. *Journal of Civil Engineering and Management*, 14(2), 95-106.
- Kazaz, A., & Ulubeyli, S. (2006). *Physical Factors Affecting Productivity of Turkish Construction Workers*. Paper presented at the Proceedings of the 22 nd Annual ARCOM Conference.

- Kumar, A. (2011). Published on Aug 21, 2011, Retrieved from <https://www.slideshare.net/arunkumarkgr1/construction-labor>
- Lavrakas, P. J. (2008). *Encyclopedia of survey research methods*: Sage Publications.
- Lee, J., & Lee, D.-R. (2009). Labor-management partnership at Korean firms: Its effects on organizational performance and industrial relations quality. *Personnel Review*, 38(4), 432-452.
- Lill, I. (2008). *Sustainable management of construction labour*. Paper presented at the Proceedings of the 25th International Symposium on Automation and Robotics in Construction ISARC-2008, Vilnius Lithuania, Vilnius: Technika.
- Liu, A., & Wall, G. (2005). Human resources development in China. *Annals of Tourism Research*, 32(3), 689-710.
- Loosemore, M. (2000). *Crisis management in construction projects*.
- Loosemore, M., Dainty, A., & Lingard, H. (2003). *Human resource management in construction projects: strategic and operational approaches*: Taylor & Francis.
- Malhotra, N. K. (2007). *Marketing research an applied orientation*: Pearson Education India.
- Marisa, A. (2012). Motivation among the Managers in Construction Companies. *World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, 6(2), 166-170.
- Mori G. Nihonoroushikankeishisutemu (The Labor-Management Relations System in Japan) (in Japanese). Tokyo: Nihon Rodo Kyokai; 1981.
- Mozael, B. M. (2015). Impact of training and development programs on employee performance. *International Journal of Scientific and Research Publications*, 5(11), 37-42.
- Mullins, L. J. (2007). *Management and organisational behaviour*: Pearson education.
- Naing, L., Winn, T., & Rusli, B. (2006). Practical issues in calculating the sample size for prevalence studies. *Archives of orofacial Sciences*, 1, 9-14.
- Najmi, h. (2011). *Project Management for Construction Projects*. An-Najah National University Palestine. .

- Naoum, S. G. (2012). *Dissertation research and writing for construction students*: Routledge.
- akayama I. Roushikankeinokeizaisyakaigaku (The Economic-sociology of LaborManagement Relations) (in Japanese). Tokyo: Nihon Rodo Kyokai; 1974.
- Naqvi, S. M. H., & Khan, M. A. (2013). Employees Training and Organizational Performance: Mediation by Employees Performance.
- Nassazi, A. (2013). effects of training on employee performance.: Evidence from Uganda.
- Nawi, M., Nasrun, M., Baluch, N. H., & Bahaudin, A. Y. (2014). *Impact of fragmentation issue in construction industry: An overview*. Paper presented at the MATEC Web of Conferences.
- Newitt, K. (2013). Private sector voluntary initiatives on labor standards. *Background paper prepared for the World Development Report. London: Ergon Associates.*
- Ogunlana, S. O. (2008). Critical COMs of success in large-scale construction projects: Evidence from Thailand construction industry. *International Journal of Project Management*, 26(4), 420-430.
- Okoye, P., & Ezejiofor, R. A. (2013). The effect of human resources development on organizational productivity. *International Journal of Academic Research in Business and Social Sciences*, 3(10), 250.
- Palestinian Central Bureau of Statistics, 2017. Performance of the Palestinian Economy, 2016. Ramallah – Palestine.
- Parker, N., Lema, N., & Mlingwa, G. (1987). *An analysis of labour productivity in Tanzania*. Paper presented at the Proc., 5th CIB W65 Int. Symp. on the Organisation and Management of Construction: Managing Construction Worldwide.
- Robson, C., & McCartan, K. (2016). *Real world research*: John Wiley & Sons.
- Rowan, M. (2013). Importance of Construction Labour Monitoring as Social Impact Assessment Mitigation in Infrastructure Projects *Principal Social Scientist*.
- Rumane, A. R. (2016). *Quality management in construction projects*: CRC Press.

- Salameh, W. (2012). *Towards sustainable construction systems of external walls of buildings in the West Bank of Palestine*. (M.Sc), An-Najah university of Palestine.
- Sathe, M. T. T., Patil, S., & Waghmare, A. P. (2017). Importance Of Incentives and Motivation Human Element in Construction Industry.
- Sekaran, U., & Bougie, R. (2016). *Research methods for business: A skill building approach*: John Wiley & Sons.
- Seo, J.-W. (2011). *Excessive overtime, workers, and productivity: evidence and implications for better work*: ILO.
- Shahraki, A., konarizadeh, M., Paghaleh, M. J., & Zarei, M. (2011). HRM effects on TQM. *Business Management Dynamics*, 1, 01-12
- Soekiman, A., Pribadi, K., Soemardi, B., & Wirahadikusumah, R. (2011). Factors relating to labor productivity affecting the project schedule performance in Indonesia. *Procedia engineering*, 14, 865-873.
- Srivastava, S., & Barmola, K. C. (2012). Role of motivation in higher productivity. *Management Insight*, 7(1).
- Tabassi, A. A., Ramli, M., & Bakar, A. H. A. (2011). Training, motivation and teamwork improvement: The case of construction firms. *African Journal of Business Management*, 5(14), 5627.
- Thomas, S. J. (2004). *Using web and paper questionnaires for data-based decision making: From design to interpretation of the results*: Corwin Press.
- Ton, Z. (2009). The effect of labor on profitability: The role of quality.
- Trebilcock, A. (2015). labor relation and human resource management *Encyclopaedia of Occupational Health and Safety*.
- Wachira, I. (2001). Labour management in Kenya. *Department of Building Economics and Management, University of Nairobi*.
- Wilkinson, A., Allen, P., & Snape, E. (1991). TQM and the management of labour. *Employee Relations*, 13(1), 24-31.
- Xiangquan, Z., & Kuang, T. (2011). Strategic Labor Relations Management: Contents, Challenges and Outlook [J]. *Journal of China Institute of Industrial Relations*, 4, 000.

Yi, W., & Chan, A. P. (2013). Critical review of labor productivity research in construction journals. *Journal of Management in Engineering*, 30(2), 214-225.

Yin, R. K. (2013). *Case study research: Design and methods*: Sage publications.

Zohrabi, M. (2013). Mixed method research: Instruments, validity, reliability and reporting findings. *Theory and Practice in Language Studies*, 3(2), 254.

Appendices

Appendices A : Questionnaire (English)

The Islamic University–Gaza
Faculty of Engineering
Master of Civil Engineering
Engineering Projects management



الجامعة الإسلامية - غزة
كلية الهندسة
ماجستير الهندسة المدنية
إدارة المشروعات الهندسية

Questionnaire

The Effect of Labor Management by Contracting Companies on the Project Quality in the Gaza Strip

Dear Sir :

To start, I would like to present my appreciation and thanks to you for taking part of your time and effort to complete this questionnaire.

This questionnaire aims to study practice of labor management in the contracting companies at Gaza Strip and identifying the major factors, barriers and methods adopted and their effects on projects quality. This is part of partial fulfillment of the requirements for degree of Master of Science in Civil Engineering / Engineering Projects Management from Islamic University.

All information in the questionnaire will be used for research with complete commitment for absolute secrecy to your information.

Contents of Questionnaire:-

Section 1: Respondent and company general information.

Section 2: Local labor management situation in contracting company.

Section 3: Factors affecting of labor management that leading to achieving quality in contracting companies.

Section 4: Factors that barring implementation of labor management in contracting companies in the Gaza Strip.

Section 5: Best activities to have a good project quality during efficient method in labor management .

Researcher
Amjad G. Mizyed

Supervisor
Dr. Nabil El Sawalhi

PART I: General information about company

Please put (✓) on the box in the front of the selection choice:

<p>1. Job description</p> <p><input type="checkbox"/> Project manager <input type="checkbox"/> Company manager <input type="checkbox"/> Site engineer <input type="checkbox"/> Others.</p>
<p>2. Your experience in the construction works (years)</p> <p><input type="checkbox"/> Less than 3 years <input type="checkbox"/> From 3 to less than 5 years <input type="checkbox"/> From 5 to less than 10 years <input type="checkbox"/> More than 10</p>
<p>3. Your company classification class according to the Palestinian Contractors Union (PCU) (At building)</p> <p><input type="checkbox"/> Firsts class <input type="checkbox"/> Second class <input type="checkbox"/> Third class</p>
<p>4. Your company experience in the construction industry</p> <p><input type="checkbox"/> Less than 3years <input type="checkbox"/> From 3 to less than 5 years <input type="checkbox"/> From 5 to less than 10 years <input type="checkbox"/> More than 10</p>
<p>5. Your company size (number of workers)</p> <p><input type="checkbox"/> Less than 10 <input type="checkbox"/> From 11 to 30 <input type="checkbox"/> From 31 to 50 <input type="checkbox"/> More than 50</p>
<p>6. Types of implemented projects through yours company in the last five years.</p> <p><input type="checkbox"/> Residential <input type="checkbox"/> Infrastructure <input type="checkbox"/> Public buildings <input type="checkbox"/> Electric and Mechanic</p>
<p>7. Number of executed projects in the last five years by your company</p> <p><input type="checkbox"/> 10 projects or less <input type="checkbox"/> 11-20 projects <input type="checkbox"/> 21-30 projects <input type="checkbox"/> More than 30</p>
<p>8. Total value of executed projects during the last five years (million dollars)</p> <p><input type="checkbox"/> Less than 1 <input type="checkbox"/> From 1 to less than 5 <input type="checkbox"/> More than 5</p>
<p>9. Number of permanent worker in company</p> <p><input type="checkbox"/> 10 persons or less <input type="checkbox"/> 11-20 persons <input type="checkbox"/> 21-30 persons <input type="checkbox"/> More than 30 persons</p>

PART 2 : The list below identify the current situation of labor management in construction project. Please tick the appropriate item that you strongly agree (SA), Agree (AG), Disagree (DA), Strongly disagree (SD) or Don't know (DK) the statement as below:

No	Factor	SD	DA	DK	AG	SA
1	Good communication	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Skilled and experience labor force	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Understanding between labor crew and supervision crew	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Suitable number of worker in construction site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The performance of workers is classified as highly productive	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	There is gap between knowledge and application in labor management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	My company providing strategy to managing labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Labor wages represent important part of the project overall cost	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Company have a labor monitoring strategy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	The company has a program for worker health and safety site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	The company has system for personal motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	The company has a method to recruiting worker method	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Company regularly assessing the compliance to all legal obligations related to labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 3: Factor affecting in labor management practice to achieve high project quality :

To what extent of influence the labor management factors affecting to achievement quality in contracting companies:

1.Low degree effect 2. Something effect 3.Moderatly effect 4. Significantly affect 5. Very Significantly effect

No	Factor related to labor	low degree	Something effect	moderate ly effect	Significa ntly	Very Significa
1	Suitable Labor age	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Fair wage	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Labor skill and competency	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Understand to responsibility.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	The labor was affected by negative factors of life	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Labor culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Worker hour- determined	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Absenteeism at work site	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Mutual trust between labor in project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Sequence of work and its continuously	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Role of union of labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Mechanisms for contract	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Effectiveness of labor to participate in the development of labor management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

No	Factors related to company's management	low degree	Somewhat	moderately	Significantly	Very Significant
1	Skill and experience of managing staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Good and fair subcontract condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Scheduling of tasks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Labor operating system (lump sum- daily wage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Amount of contractors cash flow	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Top management support for projects worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Investment in research and development and feedback from previous projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	The company lacks long-term vision and it is short-term oriented	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Taking the reputation of the company into consideration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Labors rotation in company to develop their skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Factors related to project nature					
1	Uniqueness of project and ease to do	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Site condition and environment (light ,noise , cold)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Housekeeping and service to labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Design change and late information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Poor specification	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Inclement weather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Site safety and healthy factor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART4: Barriers that face implementing labor management in contracting company
 How would you rate the following barriers that face implementing labor management
 . Please tick (✓) in front of the option that reflect your point of view

No	Factor	Extremely important barrier	Important barriers	Moderate barriers	Somewhat of a barrier	Not a barrier
1	New technology which required special skills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Poor image to industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	High mobility of construction worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Dissatisfaction with labor organization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Stability of political condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	High number of employees in project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Difficult in measuring productivity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Lack of alignment goal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Growth of self-employment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Globalization and culture difference	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Contractual condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Problem related with issue of women	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Lack of motivation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Lack of training	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	Fragmentation of the construction process (Increased industry parties and divided processes)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	In effective management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PART 5: The best labor management activities to enhance quality during project construction

The table below lists the most popular labor management activities in construction. We want to indicate at what level each activity will help to enhance quality during project construction, if applied. From your point of view, put (√) in the box of the selected effectiveness level of each one of the following activities on a five-point scale.

No	Factor	low degree effect	Something effect	moderately effect	Significantly affect	Very Significantl y effect
1	On time payment to the worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	Unified labor law	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Corporative relation between labor and management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	Prompt challenge and accomplishment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	Monitoring to labor performance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	Implementing best practice for quality engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	Advance site layout	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	Maintain work discipline	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	Facilities to labor	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	Use of machine and automated system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	Good strategy to recruiting worker	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	Delegation responsibilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	Training the worker(improve skills , developed performance)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	Motivation to worker(Bonus, Incentives)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Thanks a lot ,,

Appendix (B): Questionnaire (Arabic)

The Islamic University–Gaza
Faculty of Engineering
Master of Civil Engineering
Engineering Projects Management



الجامعة الإسلامية - غزة
كلية الهندسة
ماجستير الهندسة المدنية
إدارة المشروعات الهندسية

استبانة

تأثير إدارة العمال من قِبَل شركات المقاولات على جودة المشاريع في قطاع غزة

الأخ الكريم:

بداية نتقدم لسيادتكم بالشكر الجزيل، لتخصيكم جزء من وقتكم لهذه الرسالة وتعبئة هذا الاستبيان: تهدف هذه الاستبانة إلى دراسة ممارسات إدارة العمال في شركات المقاولات في قطاع غزة، وتحديد أهم العوامل والأساليب والعقبات التي تواجهها، وتأثيرها على جودة المشاريع الإنشائية . إن هذه الرسالة تأتي في إطار استكمال متطلبات الحصول على درجة الماجستير في الهندسة المدنية - قسم إدارة المشروعات الهندسية من الجامعة الإسلامية. كما نحيطكم علماً أن جميع المعلومات الواردة في هذه الاستبانة ستستخدم في أغراض البحث العلمي فقط مع الالتزام الكامل بالحفاظ على السرية الخاصة بالشركة والافراد.

مكونات الاستبيان :

الجزء الأول : معلومات خاصة بالشركة والأشخاص المشاركين بالاستبانة.

الجزء الثاني: واقع إدارة العمال في شركات المقاولات في قطاع غزة.

الجزء الثالث: أهم العوامل المرتبطة بإدارة العمال ومدى تأثيرها على جودة المشروع.

الجزء الرابع: العقبات التي تعيق تطبيق ممارسات إدارة العمال في قطاع غزة.

الجزء الخامس: أفضل الأساليب والطرق المتبعة في إدارة العمال لتعزيز الجودة في المشاريع الإنشائية.

واقبلوا فائق الاحترام والتقدير ،،

المشرف
د.م. نبيل الصوالحي

الباحث
م. أمجد غازي مزيد

الجزء الأول: معلومات عامة عن الشركة وعن من يقوم بتعبئة الاستبانة

الرجاء وضع (√) أمام الخيار الذي يتناسب مع إجابتك:

1. الوصف الوظيفي

مدير المشاريع مدير الشركة مهندس موقع أخرى

2. خبرتك في صناعة الانشاءات (بالسنوات)

أقل من 3 من 3 إلى أقل من 5 من 5 إلى أقل من 10 أكثر من 10

3. تصنيف الشركة التي تعمل فيها حسب تصنيف اتحاد المقاولين الفلسطينيين (حسب تصنيف المبانى)

درجة أولى درجة ثانية درجة ثالثة

4. خبرة الشركة التي تعمل فيها في صناعة الانشاءات (بالسنوات)

أقل من 3 من 3 إلى أقل من 5 من 5 إلى أقل من 10 أكثر من 10

5. حجم المؤسسة التي تعمل فيها(عدد العمال)

أقل من 10 من 10 إلى 30 من 31 إلى 50 أكثر

من 50

6. نوع المشاريع التي نفذتها الشركة خلال الخمس سنوات السابقة

مباني سكنية مشاريع بنية تحتية مشاريع مباني عامة ميكانيك

وكهرباء

7. عدد المشاريع التي تم تنفيذها خلال الخمس سنوات السابقة

أقل من 10 من 10 إلى 20 من 21 إلى 30 أكثر

من 30

8. قيمة المشاريع التي تم تنفيذها خلال الخمس سنوات السابقة(مليون دولار)

أقل من 1 من 1 إلى أقل من 2 من 2 إلى أقل من 5 أكثر

من 5

9. عدد العمال الثابتين في الشركة

10 أشخاص أو اقل من 11-20 شخص من 21-30 شخص أكثر

من 30

الجزء الثاني: واقع إدارة العمال في شركات المقاولات

البنود التالية توضح مدى موافقتك على واقع إدارة العمال الحالي في شركات المقاولات ، برجاء قراءة البنود والإشارة إلى رأيك حسب التالي (أوافق بشدة - أوافق - لا أعرف - غير موافق - غير موافق بشدة).

م	العامل	غير موافق بشدة	غير موافق	لا أعرف	موافق	موافق بشدة
1	هناك تواصل واتصال جيد بين العمال في الشركة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	يتوفر في الشركة عمال مهرة وذو خبرة عالية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	سهولة التفاهم بين طاقم الاشراف وطاقم العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	يعتبر عدد العمال في الموقع مناسب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	يصنف أداء العمال بعالي الإنتاجية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	هناك فجوة بين المعرفة والتطبيق فيما يخص إدارة العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	تتبع الشركة نظام معين لإدارة العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	أجرة العمال تمثل نسبة كبيرة من تكلفة المشروع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	تقوم الشركة بمراقبة أداء العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	تهتم الشركة بأمان الموقع والحالة الصحية للعمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	تقوم الشركة بتحفيز العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	تعتمد الشركة نظام معين لاختيار العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	تقيم الشركة جميع الالتزامات القانونية المتعلقة بالعمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

الجزء الثالث : العوامل التي تؤثر في إدارة العمال لتحقيق جودة عالية في مشاريع الإنشاءات

إلى أي مدى تؤثر العوامل التالية على العمال ، من أجل تحقيق جودة في المشاريع الهندسية ، حيث تم تقسيم العوامل حسب نطاق تأثيرها الى ثلاث محاور (العمال ، إدارة الشركة ، طبيعة المشروع) .
برجاء اختيار الاجابات ووضع اشارة (√) الى ما يشير الى رأيك حسب الآتي (تأثير منخفض جدا -
تأثير منخفض _تأثير متوسط - تأثير هام _تأثير هام جدا) :

عوامل متعلقة بالعمال						
م	العامل	تأثير منخفض جدا	تأثير منخفض	تأثير متوسط	تأثير عالي	تأثير عالي جدا
1	عمر العامل المناسب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	الراتب المناسب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	مهارة وكفاءة العامل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	وضوح مسنوليات العامل ودوره تجاه العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	تأثر العامل بعوامل الحياة الاجتماعية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	ثقافة العامل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	عدد ساعات العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	الغياب عن موقع العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	الثقة المتبادلة بين العاملين بالمشروع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	استمرارية العمل وتتابعه	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	دور نقابة العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	آلية وشكل التعاقد (دائم ، مؤقت)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	وجود دافعية لدى العمال للمشاركة في برامج التطوير	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

عوامل مرتبطة بإدارة الشركة						
م	العامل	تأثير منخفض جدا	تأثير منخفض	تأثير متوسط	تأثير عالي	تأثير عالي جدا
1	مهارة وخبرة طاقم الإدارة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	اختيار مقاولي الباطن وفق شروط عادلة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	جدولة وتنظيم المهام وتحديد المهام الوظيفية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	نظام التشغيل المتبع (المقاولة/الأجرة باليوم)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	كمية السيولة المالية لدى المقاول	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	دعم الإدارة العليا للعاملين	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	وجود الأبحاث والدراسات المرتبطة بالموضوع والتغذية الراجعة من المشاريع السابقة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	يوجد للشركة رؤية طويلة الأمد ولا تعتمد على برامجها قصيرة الأمد	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	أخذ سمعة الشركة بعين الاعتبار	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	تدوير العمال في الشركة لتطوير مهاراتهم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
عوامل متعلقة بطبيعة المشروع						
1	سهولة تنفيذ المشروع وقلة التعقيدات به	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	أحوال وبيئة العمل (الإضاءة-الحرارة-الضوضاء)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	ترتيب وتنظيم مكان العمل وتوفير الخدمات للعمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	تغيير التصميم وتأخر المعلومات المرتبطة بالمشروع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	ضعف جودة مواصفات المشروع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	تأثير الطقس والجو العاصف	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	أمان وسلامة موقع العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

الجزء الرابع: أبرز المعوقات التي تواجه الشركات لتطبيق آليات إدارة العمال

كيف تقيم تأثير العوائق التالية التي تواجه تطبيق آليات إدارة العمال في شركات المقاولات حسب التالي (عائق

بسيط جدا - عائق بسيط - عائق متوسط - عائق كبير - عائق كبير جدا)

الرجاء وضع (√) أمام الخيار الذي يشير إلى رأيك.

م	العامل	عائق بسيط جدا	عائق بسيط	عائق متوسط	عائق كبير	عائق كبير جدا
1	المهارات المرتبطة بالتكنولوجيا الحديثة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	نظرة سلبية إلى العاملين في الانشاءات	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	تنقل العاملين في المشاريع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	عدم الرضا الوظيفي خلال العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	عدم استقرار البيئة السياسية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	العدد الكبير للعاملين في المشروع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	صعوبة قياس الانتاجية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	عدم وضوح الهدف العام	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	ازدياد العمال الذين يعملون لصالحهم (مقاولة)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	العولمة واختلاف الثقافات	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	اوضاع التعاقد مع العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	القضايا المتعلقة بالمرأة في المشاريع الانشائية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	قلة التحفيز	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	قلة التدريب	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	تشنت صناعة الانشاءات	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	الإدارة غير الفعالة للمشاريع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

الجزء الخامس : أفضل الممارسات المتبعة في إدارة العمال للحصول على جودة عالية:

في الجدول التالي عدد من الأنشطة والممارسات المستخدمة في شركات المقاولات ، يرجى تحديد لأي درجة من الدرجات يمكن أن يكون كل ممارسة من هذه الممارسات مفيد في تطبيق إدارة العمال في شركات المقاولات وذلك بوضع اشارة (√) حسب المعيار التالي :

(غير مفيد - مفيد بدرجة قليلة - مفيد بدرجة متوسطة - مفيد بدرجة كبيرة - مفيد بدرجة كبيرة جدا)

م	العامل	غير مفيد	مفيد بدرجة قليلة	مفيد بدرجة متوسطة	مفيد بدرجة كبيرة	مفيد بدرجة كبيرة جدا
1	دفع الأجرة في الوقت المحدد وانتظامها	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	تطبيق قانون العمال الموحد	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	التعاون بين العمال والإدارة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	مواجهة التحديات التي تواجه العمل وتحقيق الانجاز	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	مراقبة أداء العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	تطبيق افضل الممارسات لهندسة الجودة	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	التخطيط المناسب للموقع	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	الانضباط في موقع العمل	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	تقديم التسهيلات للعاملين	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	استخدام الآلات والأنظمة الأتوماتيكية	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	استخدام منهجية جيدة في توظيف العمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	تفويض المسئوليات للعمال	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	تدريب العمال و تطوير مهارتهم	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	التحفيزات للعاملين(زيادات مالية-محفزات معنوية)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ولكم جزيل الشكر ،،،

Appendix(C) :Correlation coefficient

Table (C1) : Correlation coefficient of each item of " The current situation of labor management in construction project " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	Good communication	.352	0.028
2.	Skilled and experience labor force	.686	0.000
3.	Understanding between labor crew and supervision crew	.347	0.030
4.	The performance of workers is classified as highly productive	.605	0.000
5.	There is gap between knowledge and application in labor management	.360	0.025
6.	My company providing strategy to managing labor	.698	0.000
7.	Labor wages represent important part of the project overall cost	.574	0.000
8.	Company have a labor monitoring strategy	.487	0.004
9.	The company has a program for worker health and safety site	.358	0.026
10.	The company has system for personal motivation	.686	0.000
11.	The company has a method to recruiting worker method	.618	0.000
12.	Company have a labor training program	.519	0.002
13.	Company regularly assessing the compliance to all legal obligations related to labor	.407	0.013

Table (C2)-A : Correlation coefficient of each item of " Factor related to labor " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	Labor age	.649	0.000
2.	Fair wage	.606	0.000
3.	Labor skill and competency	.579	0.000
4.	Understand to responsibility.	.335	0.038
5.	The labor was affected by negative factors of life	.655	0.000
6.	Labor culture	.676	0.000
7.	Worker hour- determined	.727	0.000
8.	Absenteeism at work site	.443	0.007
9.	Mutual trust between labor in project	.735	0.000
10.	Sequence of work and its continuously	.638	0.000
11.	Role of union of labor	.582	0.000
12.	Mechanisms for contract	.692	0.000
13.	Effectiveness of labor to participate in the development of labor management	.611	0.000

Table (C2)-B: Correlation coefficient of each item of " Factors related to company's management " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	Skill and experience of managing staff	.569	0.001
2.	Good and fair subcontract condition	.726	0.000
3.	Scheduling of tasks	.594	0.000
4.	Labor operating system (lump sum- daily wage)	.677	0.000
5.	Amount of contractors cash flow	.635	0.000
6.	Top management support for projects worker	.796	0.000
7.	Investment in research and development and feedback from previous projects	.542	0.001
8.	The company lacks long-term vision and it is short-term oriented	.681	0.000
9.	Taking the reputation of the company into consideration	.673	0.000
10.	Labors rotation in company to develop their skills	.710	0.000

Table (C2)-C: Correlation coefficient of each item of " Factors related to project nature " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	Uniqueness of project and ease to do	.664	0.000
2.	Site condition and environment (light ,noise , cold)	.712	0.000
3.	Housekeeping and service to labor	.742	0.000
4.	Design change and late information	.531	0.001
5.	Poor specification	.707	0.000
6.	Inclement weather	.680	0.000
7.	Site safety and healthy factor	.805	0.000

Table (C3): Correlation coefficient of each item of " Barriers that face implementing labor management in contracting company " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	New technology which required special skills	.456	0.006
2.	Poor image to industry	.456	0.006
3.	High mobility of construction worker	.567	0.001
4.	Dissatisfaction with labor organization	.568	0.001
5.	Stability of political condition	.607	0.000
6.	High number of employees in project	.410	0.012
7.	Difficult in measuring productivity	.694	0.000
8.	Lack of alignment goal	.694	0.000
9.	Growth of self-employment	.349	0.029
10.	Globalization and culture difference	.545	0.001
11.	Contractual condition	.498	0.003
12.	Problem related with issue of women	.480	0.004
13.	Lack of motivation	.512	0.002
14.	Lack of training	.574	0.000
15.	Fragmentation of the construction process (Increased industry parties and divided processes)	.343	0.032
16.	In effective management	.475	0.004

Table (C4): Correlation coefficient of each item of " The best labor management activities to enhance quality during project construction " and the total of this field

No.	Item	Correlation Coefficient	P-Value
1.	On time payment to the worker	.449	0.006
2.	Unified labor law	.512	0.002
3.	Corporative relation between labor and management	.414	0.011
4.	Prompt challenge and accomplishment	.580	0.000
5.	Monitoring to labor performance	.690	0.000
6.	Implementing best practice for quality engineering	.780	0.000
7.	Advance site layout	.634	0.000
8.	Maintain work discipline	.608	0.000
9.	Facilities to labor	.641	0.000
10.	Use of machine and automated system	.692	0.000
11.	Good strategy to recruiting worker	.753	0.000
12.	Motivation to worker(Bonus, Incentives)	.714	0.000
13.	Training the worker(improve skills , developed performance)	.746	0.000
14.	Motivate group as individual person	.634	0.000

All thanks and praise belongs to

ALLAH

" Al-hamdulillah "