

## STUDY OF MOTIVATIONAL FACTORS AFFECTING CONSTRUCTION LABOR PRODUCTIVITY IN THE WORKING ENVIRONMENT

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### Abstract

Construction projects, as a labor-intensive industry, are directly involved with workforce management. Hence, the labor productivity issue is of remarkable interest in both the construction industry and academia because of its impact on time, cost, and quality of project. Due to the importance of labor productivity, an intensive literature review has been done to identify critical factors. Research on motivational factors affecting construction labor productivity (CLP) has attracted numerous researchers worldwide many years so far. This study aims to review studies on motivational factors affecting Construction Labor Productivity from the outcomes of previous studies. Based on a comprehensive review and publications this study adopted methods of case study for identifying motivational factors based on a review of existing literature.

In this Paper the findings indicated that the mostly identified motivational factors contain rewards; good relationship; promotion opportunities; job security; good supervision; the amount of salary; and a good work environment.

**Keywords:** Construction Management, Motivational Factor, Labor Productivity, Civil Engineering, Literature Review, Construction Labor Productivity ,work environment, human efficiency.

### 1. Introduction

The construction industry is one of the largest and most resource-consuming industries in the world, accounting for 50% of raw materials and 40% of global energy consumption ( Hazeltine 2018). The majority of economists agree with the importance of Productivity as it is one of the most frequently discussed topics in the construction industry (Yi and Chan 2013). Labor productivity is one of the key management factors to complete a project successfully. Hence, productivity has been creating remarkable interest in both the construction industry and academia. Furthermore, project managers have to improve construction productivity performance because of competitive business environments (Park et al. 2005).

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Laborers' motivation as a determinant may lead to stimulating construction productivity enhancement (Barg, J. E., Ruparathna, R., Mendis, D., & Hewage, K. N. 2014). The workforce in

construction projects is one of the difficult factors to supervise, manage, and control. Therefore, it is critically important to determine the motivational factors influencing CLP (Hamza, M., Shahid, S., Bin Hainin, M. R., & Nashwan, M. S. 2019) Understanding the motivational factors influencing CLP may lead to the development of strategies to reduce inefficiencies and improve construction project performance through more effective construction workforce management (Ailabouni, N., Gidado, K., & Painting, N. 2009). Therefore, a comprehensive and in-depth review of motivational factors impacting Construction labor Productivity should be conducted in order to provide an extensive picture to help researchers can focus further studies, thereby maximizing the chance for enhancement Construction labor Productivity.

### 1.1 Objectives of the Study

The goal of this study is to comprehensively review of previous studies have been conducted to identify and address motivational factors affecting labor productivity in the construction industry. To achieve this, specific objectives are as follows:

- a) To identify a list of motivational factors influencing CLP through a review of different studies were carried out so far by using available scientific databases.
- b) To identify the most common motivational factors affecting CLP from previous studies.

The results of this review adopted methods of empirical research for identifying and evaluating of motivational factors with a prevalent procedure that includes four stages, namely, identifying motivational factors based on a review of existing literature; data collection; data analysis; and concluding critical motivational factors.

## 2. Literature Review

Generally, there are various definitions of productivity and each company uses its own internal system to measure it (Thomas HR 1986). There are two forms of productivity used in the previous studies; productivity = output/input, productivity = input/output. The other different definitions can be identified regarding the productivity in the construction activities, one refers to the productivity when the work is implemented, and the other one refers to the value of the work based on the cost (Knutson et al. 2009).

(Hillebrandt, 2000) states that “The construction industry is the sector involved with erection, repair and demolition of buildings and civil engineering structures in an economy. The industry provides constructed physical facilities which provide space where other activities may take place. The building section of the construction industry is mainly concerned with the assembly of building materials which are supplied by the manufacturing sector and delivered to the site by the transportation sectors. To a large extent in Kenya, many of the buildings construction works still rely heavily on manual labor in their assembly which to some extent contributes to job creation.” Motivation has been defined as providing a drive to act to satisfy needs or desires (Cox et al., 2005). According to (Funso, 2016), it is a positive charge that produces motivation current that moves an individual to expend the effort that will lead to the attainment of organizational goals and meet personal needs; whereas, (Jenkins et al., 1982) stated that motivation is intangible, a

hypothetical construct that is used to explain human behavior. Another perspective, (Schmid & Adams, 2008) explained that motivation is commonly sourced from intrinsic or extrinsic motives. Extrinsic motivation reflects an instrumentality between the activity and some separable consequences such as tangible or verbal rewards; hence, satisfaction comes not from the activity itself but rather from the extrinsic consequences to which the activity leads. In contrast, intrinsic motivation reflects individuals doing an activity because they find it interesting and derive spontaneous satisfaction from the activity itself (Gagné & Deci, 2005).

In many years so far, research on motivation has been concerned by numerous researchers around the world. For the construction industry, various studies have been researched on motivational factors affecting CLP in order to identify, evaluate these factors, and recommend the measurements to improve labor productivity in the construction sector. To improve construction project performance, motivational factors influencing CLP should be identified and addressed appropriately (Hasan, A., Baroudi, B., Elmualim, A., & Rameezdeen, R. 2018). That is why various motivational factors were identified and assessed by many previous studies. For example (Aghayeva, K., & Ślusarczyk, B. 2019), identified many motivational factors affecting CLP in Azerbaijan. Accordingly, top factors were assessed impacting CLP such as amount of remuneration; high responsibility job; job security; bonuses and fringe benefits; and challenging task. In Australia, motivational factors influencing CLP were determined by (Doloi 2007); factors of job security; work appreciation and reward; work environment; prospect of promotion; and geographical position were found as determinant factors to impact on CLP. In Malaysia, (Ohueri, C. C., Enegbuma, W. I., Wong, N. H., Kuok, K. K., & Kenley, R. 2018), stated that effective management and supervision; financial incentives; effective management; viable construction practices; and sufficient reward system were the most motivational factors affecting CLP.

## 2.1 Definitions of Productivity and Labor Productivity

There is no standard definition of productivity because each business defines it differently (Park, Thomas, & Tucker, 2005). However, productivity is defined in many ways because different measures of productivity serve different purposes. It is broadly defined as a terminology for the measurement of the effectiveness on employing the management skills, workers, materials, equipment, tools, and working space in order to produce a finished building, plant, structure, or other fixed facility at the lowest feasible cost (Liu & Song, 2005; Oglesby, Parker, & Howell, 1989)

(McTague 2002) discussed below, the definition for productivity with regards to construction is the measurement of the output of construction goods and services per unit of labor. "Productivity Improvements on Alberta Major Construction Projects" compiled the following list of commonly used definitions to measure productivity in the construction industry:

*Labor Productivity = Output/ Labor Cost or Labor Productivity = Output/Work Hours*

In case the input is a combination of various factors, productivity is termed as

Total Factor Productivity and is measured as  $\text{Total Factor Productivity} = \text{Total Output} / (\text{Labor} + \text{Material} + \text{Equipment} + \text{Energy} + \text{Capital})$

According to Borcharding and Liou (1986) Construction industry is depend on 3-M resources. There are means of 3-M is manpower, machine and materials.

In general definition of productivity is ratio of output and input. There is few definition of productivity.

(Drewin, 1982).In other words, the definition of labor productivity is “the amount of goods and services produced by a productive factor (manpower) in the unit of time”.(Al-Saleh 1995) Labor productivity is simply defined as “the amount of goods and services that a laborer produces in a given amount of time. It is one of the very important issues in construction industry since it affects the time and cost performances of any construction project”.Liu and Ballard (2008) stated that “labor productivity plays a critical role in determining the financial success of a project. In most of construction projects, labor costs account for between 30 and 50% of a project’s total cost. This reflects the high importance of this resource in construction industry, meaning that any improvement in labor productivity will contribute a high deal to the improvement of the overall productivity and consequently, the project performance”.(Reeman,(2008)) stated that “Labor productivity is equal to the ratio between a volume measure of output (gross domestic product or gross value added) and a measure of input use (the total number of hours worked or total employment).

Labor productivity = volume measure of output / measure of input use

“The volume measure of output reflects the goods and services produced by the workforce.”

Teicholtz, Paul (2007) states that “Labor productivity is one of the least studied areas within the construction industry. Productivity improvements achieve high cost savings with minimal investment. Due to the fact that profit margins are small on construction projects, cost savings associated with productivity are crucial to becoming a successful contractor. The chief setback to improving labor productivity is measuring labor productivity”.

Ziad Abu Mustafa (2007) according to the author the five most widely used productivity concepts are: Labor productivity, based on gross output. This productivity measurement traces the labor requirement per unit of output. It reflects the change in the input coefficient of labor by industry and is useful for the analysis of specific industry labor requirements.Labor productivity, based on value-added. Value-added based labor productivity is useful for the analysis of micro-macro links, such as an individual industry’s contribution to economy-wide labor productivity and economic growth. Capital-labor MFP, based on value-added. This productivity measurement is useful for the analysis of micro-macro links, such as the industry contribution to economy-wide MFP growth and living standards, as well as, for analysis of structural change. Its main advantage as a productivity measure is the ease of aggregation across industries. Capital productivity, based on value-added. Changes in capital productivity denote the degree to which output growth can be achieved with lower welfare costs in the form of foregone consumption. Its main advantage as a productivity measure is its ease of readability but capital productivity suffers the same limitations as other partial productivity measurements.

Klems multi-factor productivity. Klems-mfp is used in the analysis of industry-level and technical change. It is the most appropriate tool to measure technical change by industry because it fully acknowledges the role of intermediate inputs in production.

## 2.2 Identification of motivational Factors Affecting Construction Labor Productivity

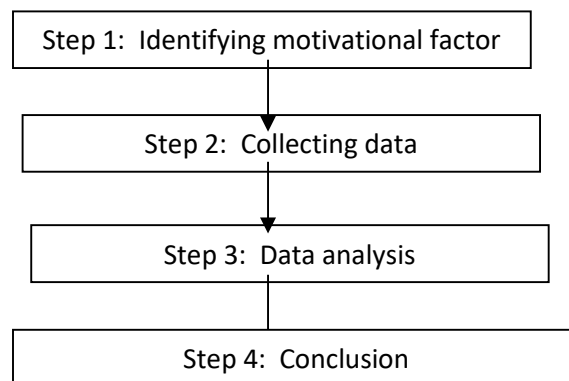
Motivational factors influencing CLP were determined by (Doloi, 2007); factors of job security; work appreciation and reward; work environment; prospect of promotion; and geographical position were found as determinant factors to impact on CLP. In Malaysia, (Ohueri et al., 2018) stated that effective management and supervision; financial incentives; effective management; viable construction practices; and sufficient reward system were the most motivational factors affecting CLP; whereas, factors of bonus or rewards; amount of salary; friendliness and helpfulness of the coworkers; amount of freedom in your work; and chance for getting a promotion were important factors affecting CLP in Canada. Table 1 indicates the top motivational factors affecting Construction Labor Productivity which were ranked by different researchers.

## 3. Methodology

This article review carried out a review related papers based on an examination literature on the identification of motivational factors influencing CLP. It synthesizes and assesses the current state of existing papers to identify patterns and trends in the existing research body and recommends new future studies. The methodology of this study conducted a research approaches was case study. In this regard, all journals adopted are prominent construction research journals. In these scientific journals, this study carefully researched through the titles of all the articles appearing in each issue of all the volumes looking for any papers which were to be concerned with motivational factors affecting labor productivity on construction project.

### 3.1 Discussion and Analysis

This study conducted a review of literature for the previous studies to provide an overview on motivational factors affecting Construction Labor Productivity.



In this regard, all publications in journals the abstracts of publications that had some relevance to motivational factors were examined closely and the ones which had the keyword construction labor productivity in the abstract were considered for this study consequently, a total of 17 publications on this domain were considered for further analysis.

Table 1. Studies on motivational factors affecting construction labor productivity

Study	Region	Total factors identified	Top motivational factors affecting construction labor productivity
Hewage (2007)	Canada	21	(1) Bonus or rewards; (2) Amount of salary; (3) Friendliness and helpfulness of the coworkers; (4) Amount of freedom in your work; (5) Chance for getting a promotion
Doloi (2007)	Australia	23	(1) Job security; (2) Work appreciation and reward; (3) Work environment; (4) Prospect of promotion; (5) Geographical position
Dwivedula and Bredillet (2010)	Multi-nation	14	(1) Employee development; (2) Work climate; (3) Perceived equity; (4) Work objectivity; (5) job security
Funso et al. (2016b; 2016a)	Nigeria	12	(1) Job security; (2) Good salary; (3) Compliance with safety; (4) Appreciation of effort; (5) Bonus
Jarkas et al. (2014)	Qatar	30	(1) Lack of financial incentive schemes; (3) Slow decision-making process by owners; (3) Remuneration scale; (4) Delay in responding to requests for information; (5) Shortage of skilled labor force
Al-Abbadi and Agyekum-Mensah (2019)	Jordan	14	(1) Personal growth/career improvement; (2) Pay on time; (3) Decision-making ability; (4) Decent and respectful job; (5) Rewards
Olomolaiye (1990)	UK	18	(1) Good relations with mates; (2) Good safety program; (3) The work itself; (4) Overtime; (5) Level of pay
Shin et al. (2013)	Korea	20	(1) Economical factors; (2) Social factors; (3) Psychological factors
Ng et al. (2004)	Hong Kong	8	(1) Rework; (2) Overcrowded work areas; (3) Crew interfacing; (4) Tool availability; (5) Inspection delays
Khan et al. (2011)	Pakistan	20	(1) Free lunch; (2) Amount of pay/wages (3) Bonus on Eid; (4) On-time payment; (5) Incentive payments and financial rewards
Kazaz et al. (2008)	Turkey	13	(1) Quality of site management; (2) Material management; (3) On-time payment; (4) Systematic flow of work; (5) Supervision
Parkin et al. (2009)	Turkey	15	(1) Money; (2) Relationships; (3) Enjoyment; (4) Home life; (5) Getting a poor quality meal

Zakeri et al. (1997)	Iran	10	(1) Weather temperature; (2) Lack of working area; (3) Skillfulness; (4) Average workweek (hour); (5) Project management efficiency
Ghoddousi et al. (2015)	Iran	12	(1) Fairness of pay; (2) Incentives and financial rewards; (3) On-time payment; (4) Good working facilities; (5) Safety and health at work
Nasirzadeh and Nojedehe (2013)	Iran	6	(1) Empowerment; (2) Delay in salary payment; (3) Job security; (4) The proportion of labor's salary and responsibility; (5) interpersonal interaction
Momade and Hainin (2019)	Qatar	10	(1) Achievement; (2) Proper recognition and rewards, (3) Poor work conditions; (4) Poor administration policy; (5) Poor work relationship
Gunduz and Abdi (2020)	Qatar	19	(1) Sharing specific design solutions with partners when needed; (2) Sharing technical solutions in work implementation; (3) Share experience in defining the scope of works and specifications to subcontractors; (4) Having better utilization of construction equipment and machinery; (5) Enhance health, security, safety and environmental control

#### 4. Results and Findings

Most common motivational factors affecting construction labor productivity through a comprehensive review of the 17 publications related to this topic that were analyzed in the this study, the motivational factors influencing construction labor productivity for each paper are represented in Table 2. The total number of motivational factors affecting labor productivity in the construction industry that were identified from the 17 selected papers is 24. The number of times a motivational factor was identified by the author is accumulated and presented in Table 2. Numerous studies have been undertaken to identify motivational factors influencing CLP.

Table 2. Motivational factors affecting construction labor productivity

No	Motivational factors	Publications (researchers)																	Total
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	
1	Rewards	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x		15
2	Good relationship	x		x	x	x	x	x	x				x	x	x	x	x	x	14
3	Promotion opportunities	x	x	x	x	x	x	x	x				x	x	x		x		13

4	Job security	x	x	x	x	x	x	x	x	x				x	x	x			12	
5	Amount of salary	x			x	x	x	x	x	x	x	x			x	x			12	
6	Good supervision	x			x	x	x	x		x	x			x					9	
7	Good work environment		x			x		x	x	x	x			x				x	9	
8	Recognition programs		x	x		x	x		x								x		7	
9	Participation in decision making	x			x	x		x	x					x					7	
10	On-time payments				x						x	x	x		x			x	6	
11	Work satisfaction					x		x		x				x	x			x	6	
12	Giving responsibility							x	x	x				x	x	x			6	
13	Challenging work opportunities	x	x			x	x		x	x									6	
14	Opportunities to develop skills and abilities	x			x	x	x											x	5	
15	Work appreciation	x	x	x		x												x	5	
16	Working overtime					x	x		x					x				x	5	
17	Freedom in work	x			x	x	x							x	x				x	4
18	Job training					x													4	
19	Tools and equipment quality	x				x			x										3	
20	Team cooperation	x				x			x										3	
21	Organization's reputation		x											x					3	



22	Relax amenities	x			x														2
23	Holidays and free time	x									x								2
24	Good management										x	x							2
1=(Hewage, 2007); 2=(Doloi, 2007); 3=(Dwivedula & Bredillet, 2010); 4=(Hewage & Ruwanpura, 2006); 5=(Funso et al., 2016b); 6=(Jarkas et al., 2014); 7=(Al-Abbadi & Agyekum-Mensah, 2019); 8=(Olomolaiye, 1990); 9=(Shin et al., 2013); 10=(Khan et al., 2011); 11=(Kazaz et al., 2008); 12=(Parkin et al., 2009); 13=(Zakeri et al., 1997); 14=(Ghoddousi et al., 2015); 15=(Nasirzadeh & Nojedehi, 2013); 16=(Momade & Hainin, 2019); 17=(Gunduz & Abdi, 2020).																			

From the results analysis in Table 2, that several common motivational factors impacting CLP, but the top motivational factors that are: Rewards; Good relationship; Promotion opportunities; Job security; Amount of salary; Good supervision; and good work environment. Each of these motivational factors was identified 15; 14; 13; 12; 12; 9; and 9 times by the 17 publications considered in this study respectively. This evidence indicates how important of these motivational factors that have the most effect on CLP.

**Rewards:** The factor of rewards is one of the motivational factors influencing CLP, so it is not surprising that the factor was identified by 15 different publications as a determinant impacting labor productivity in the construction industry. The finding shows that being rewarded, while not being financially exclusive is key motivational factors that improved the construction workforce's productivity

**Good relationship.** A good work environment where have a good relationship between workmates is a key factor for the success of any task. That is why the factor of the good relationship was identified by 14 publications as a critical motivational factor impacting construction labor performance.

**Promotion opportunities:** The promotion opportunities factor was identified in 13 times from 17 papers on motivating factors affecting CLP. It is obvious that a move up the career ladder impact organizational justice and work satisfaction of any employee.

**Job security:** The job security factor is ranked 4th among the top important motivational factors identified in the literature and was identified in 12 different articles.

**Amount of salary:** As demonstrated in the previous studies, remuneration was not the only motivational factor, but money was an essential basic need for any individual in order to ensure their lives and prosper. The amount of salary factor was identified by 12 publications on motivational factors affecting labor productivity in the construction sector.

**Good supervision:** In this regard, it is controlled based on the inspection of the tasks completed by the workforce. This factor was identified by 9 different publications on motivational factors influencing CLP.

**Good work environment:** A good work climate with sufficient work conditions may lead to enhance individual job satisfaction and commitment of laborers with their organization, it can make individuals effort their best which may improve labor productivity. The factor of the good work environment was identified by 9 studies on motivational factors affecting CLP

## 5. Conclusions

Work motivation as a catalysis for the construction workforce to complete the task in a much better way that must to improve working performance in construction.

Utilizing analysis of the 17 publications related to motivational factors impacting CLP. It was found that numerous critical factors impacting labor productivity in the construction sector, but the top comment motivational factors that have the most impact on labor productivity in the construction industry in this study are rewards; good relationship; promotion opportunities; job security; amount of salary; good supervision; and good work environment.

Therefore, it is encouraged that engineering managers, project managers, employers should focus on top influential factors to ensure effective management and improve the productivity of the construction workforce.

The study's principal weakness is that the use of specific keywords to find papers on this area does not cover all possible possibilities. As a result, the research findings may not fully reflect the total literature on this topic.

This study has provided a general overview of the development of motivational factors affecting CLP, hence formed a solid platform for scientists for further studies.

### 5.1 Future Recommendation

This study has reviewed the implications of numerous studies on motivational factors affecting labor productivity in the construction industry. As a result, the author has highlighted some knowledge gaps relating to motivational factors toward improving construction workforce productivity which provides a strong platform for further studies as follows:

Depending on the circumstances, the frequency and importance of motivational factors vary from project to project, country to country, and even within the same project. A large number of motivating factors influencing CLP were identified and evaluated in previous studies so far which draw a comprehensive picture in construction work motivation.

Therefore, key motivational factors (i.e., rewards; good relationship; promotion opportunities; job security; the amount of salary; good supervision; good work environment; recognition programs; participation in decision making; and on-time payments) should be examined in more depth in future empirical researches.

## 6. References

- 1) Aghayeva, K., & Ślusarczyk, B. "Analytic hierarchy of motivating and demotivating factors affecting labor productivity in the construction industry:." the case of Azerbaijan. Sustainability,, 2019: 21.
- 2) Ahola, T. Efficiency in project networks: the role of inter organizational relationships in project management. Helsinki: Helsinki university of technology, 2009.

- 3) Ailabouni, N., Gidado, K., & Painting, N. . "Factors affecting employee productivity in the UAE construction industry." Paper presented at the 25th Annual ARCOM Conference, Nottingham, UK., 2009: 19.
- 4) An, N. et.al. "Contribution of project managers' capability to project ending performance under stressful conditions." European Management Journal. <https://doi.org/10.1016/j.emj.2018.04.001>, 2018: 1-23.
- 5) Anantatmula, V. S. "Strategies for Enhancing Project Performance." Journal of Management in Engineering, [https://doi.org/10.1061/\(ASCE\)](https://doi.org/10.1061/(ASCE)), 2015: 1-19.
- 6) Axelos. Managing successefull projects with price. London: Stationery office London, 2009.
- 7) Barg, J. E., Ruparathna, R., Mendis, D., & Hewage, K. N. "Motivating workers in construction." Journal of Construction Engineering, 3(2), 21-35. <http://dx.doi.org/10.1155/2014/703084>, 2014: 17.
- 8) Barney, J. "purchasing supply management and sustained competitive advantage: tye relevance of resource based theory." supply chain management, 2012: 1-23.
- 9) Bresman, H. "External learning activities and team performance:a multimethod field study." jornal of organization science, 2010: 1-21.
- 10) Bures, V. Cultural barriers in knowledge sharing. Economics and Management. Liberec, 2003.
- 11) Cheah, Y.N. "enhancing groupware for knowledge management ." 5th international conference on information technology. Malaysia: international conference Asia, 2007. 245-250.
- 12) chenge ,G.H., Yeh, C.H. and Tu, C.W. "Trust and knowledge sharing in green supply chain." international jornal supply chain management, 2008: 1-1.
- 13) Cho, Y., Lee, C., and Mok, E. "The effects of cooperativeactivities with competitors on the performances of innovation and management." 2017: 1-10.
- 14) Das, D., & Ngacho, C. "Critical success factors influencing the performance of development projects :." An empirical study of Constituency Development Fund projects , 2017: 276–293.
- 15) Demirkesen & Ozorhon. "impact of integration management on construction project management performance ." international jornal of project management , 2017a : 19.
- 16) Diallo, A. and Thuillier, D. "the successes of international development project." international jornal of project management, 2005: 21.

- 17) Doloi, H. "Twinning motivation, productivity and management strategy in construction projects." *Engineering Management Journal*, 2007: 21.
- 18) Dubois, A and Gadde, L.E., "supply strategy and network effects purchasing behavior in the construction industry." *Journal of purchasing and supply management*, 2000: 1-8.
- 19) Egbu, C.O. "The role of knowledge management and innovation in improving construction competitiveness." *Journal of building technology and management*, 1999: 1-25.
- 20) Fink, L. "The Impact of the Customer Focus Competence Group on Project Performance." *Research in Competence-Based Management*, 2014: 1-17.
- 21) Grabdori, A. "An organization assessment of interfirm coordination modes." *Journal of organizational study*, 1997: 1-18.
- 22) Gupta, A.K. and Govindarajan, V. "'Knowledge flows within multinational corporations'," *Strategic management Journal*, 2000a: 1-17.
- 23) H. Timonen and J. Ylialo. "Exploration of knowledge sharing challenges in value networks." *Journal of knowledge management*: <http://www.ejkm.com>, 2007: 1-18.
- 24) Hamza, M., Shahid, S., Bin Hainin, M. R., & Nashwan, M. S. . "Construction labour productivity:." review of factors identified. *International Journal of Construction Management*, 2019: 21.
- 25) Haq, S. U., Liang, C., Gu, D., Du, J. T., & Zhao, S. "Project Governance, Project Performance, and the Mediating Role of Project Quality and Project Management Risk." *An Agency Theory Perspective. Engineering Management Journal*, 2018: 1-18.
- 26) Hasan, A., Baroudi, B., Elmualim, A., & Rameezdeen, R. "Engineering, Construction and Architectural Management." *Factors affecting construction productivity: a 30 year systematic review*, 2018: 19.
- 27) Hazeltine, C. S. "Motivation of construction workers." *Journal of the Construction Division*, 102(CO3). <https://doi.org/10.1061/JCCEAZ.0000626>, 2018: 18.
- 28) Horner, B., Gemino, A., & Sauer, C. "How knowledge management impacts performance in projects :." *International Journal of Project Management*, 32(4), 590–602. <https://doi.org/10.1016/j.ijproman.2013.09.004>, 2014: 590-602.
- 29) Horner, B., Gemino, A., & Sauer, C. "How knowledge management impacts performance in projects." *International Journal of Project Management*, <https://doi.org/10.1016/j.ijproman>, 2014: 1-16.

- 30) Hult, G.T.M., Cavusgil, S.T. and Calantone, R.J. "Knowledge as a strategic resource in logistics and purchasing",. MSI Reports Working Paper Series, 2003a: 1-14.
- 31) Ibrahim, C.K.I.C., Costello, S.B. and Wilkinson, S. "Key indicators influencing the management." International Journal of managing projects in bussiness, 2015: 1-17.
- 32) Ikediashi, D. I., & Ogwueleka, A. C. "Assessing the use of ICT systems and their impact on construction project performance in the Nigerian construction industry." Journal of Engineering, Design and Technology, 14(2), , 2016: 1-13.
- 33) Ingram, P. and Baum, J.A.C. Interorganizational learning and the dynamics of chain relationship. Stamford: Emeraled group publishing Limited, 2001.
- 34) Jap., S.D. "Collaboration process in buyer- supplier relation ship." journal of marketing research, 1999: 14.
- 35) Kadefors, A. "Knowledge in project relationship." international jornal of project management, 2004: 1-22.
- 36) Kanter, R.R. "Collaborative advantage: the art of alliances." Harvard bussiness review, 1994: 1-15.
- 37) Kara, E. "The effect of total quality management on employees performance: a study on textile busibess." International jornal of business and management studies, 2018: 1-13.
- 38) Lai, C., Hsu, J. S., & Li, Y. "Leadership , regulatory focus and information systems development project team performance." International Journal of Project Management, 36(3), 566–582. <https://doi.org/10.1016/j.ijproman.2017.11.001>, 2017: 566-582.
- 39) Larsson, J. "The importance of hard project management and team motivation for construction project performance." International JJournal of Managing Projects in Business, 11(2). <https://doi.org/10.1108/IJMPB-04-2017-0035>, 2018: 04-17.
- 40) Lin, Y., Wang, L Tseng, H,P. "enhancing knowledge exchange through web map based knowledge management system in construction." 693-705. Taiwan: Automation in construction, 2006.
- 41) Lindhard, S. & Larsen, J. K. Identiying the key process factors affecting project performance. Engineering construction and architectural management , 2016.
- 42) Liu, C.Y., pirola-Merlo, A, Yang, C.A, Huang, C,. "Disseminating the functions of a team coaching regarding research and development teameffectiveness: evidence from high tech industries ." international jornal, 2009: 1-17.Lnc, web Finance. innovation, Business dictionary , available at . 2017.

- 43) Lusch, R.F., Vargo, S.L. and Tanniru, M. "“Service, value networks and learning”." Journal of the academy of marketing science , 2010: 1-15.M. Alavi and D.E . Leidner. Knowledge management and knowledge management systems: conceptual foundation and research issues. Indian, 2001.
- 44) Momade, M. H., & Hainin, M. R. (2019). Identifying motivational and demotivational productivity factors in Qatar construction projects.
- 45) Manu, E, Ankrah,N,Chinyio, E and Proverbs,D. "Trust influencing factors in main contractor and subcontractor relationship during projects." international jornal of project management, 2015: 1-13.
- 46) Martens,M.L and Carvalho, M.M. "The challange of introducing sustainability into project management function: multiple case studies." Jornal of cleaner production, 2016: 1-18.
- 47) Min, S., Roath, A.S., Daugherty, P.J., Genchev.S.E., Chen,. h.,Arndt, A.D and Richey , R.G. "supply chain collaboration: What's happening." The international jornal of logistics management, 2005: 17.
- 48) Newell, S., Bresnen, M. Edelman, L., Scarbrough. Sharing knowledge accross projects. 2006.
- 49) Ofek. E. and Sarvary, M . . Leveraging the custemer base: creative competitive advantage through knowledge management, management science. 2001.
- 50) Ohueri, C. C., Enegbuma, W. I., Wong, N. H., Kuok, K. K., & Kenley, R. "Labour productivity motivation framework for Iskandar Malaysia." Built Environment Project and Asset Management,, 2018: 22.
- 51) Okhuysen, G.A, Bechky, B.A. Coordination in organizations: an intergative perspective. Acadamic of management Annals, 2009.
- 52) P.J. and Lubatkin, M. "“Relative absorptive capacity and interorganizational." Strategic Management Journal, 1998: 1-14.
- 53) Park H-S, Thomas SR, Tucker RL. "Constructin Engineering Management." Benchmarking of, 2005: 16.
- 54) Press, Cambridge University. knowledge integration . Cambridge, 2017.
- 55) Qiu, T., Qualls, W., Bohlmann, J., Rupp, D.E,. "The effect of international fairness on the performance of cross functional product development teams: a multilevel mediated model." jornal of product innovation management, 2009: 1-14.
- 56) Ratnawat, R. G and Jha, p.c. "impact of job related stresson employee performance: A review and research agenda." jornal of business and management, 2019: 1-16.

- 57) Sanghani, P. "Knowledge management implementation holistic framework ." Indian study in proc.of pacific Asia. Asia: Comference on information systems, 2009.
- 58) Segev, E. "Mapping knowledge into a database mode." jornal of knowledge management practice, 2010: 1-17.Silver et al. "How to Begin a Quality Improvement Project." <https://doi.org/10.2215/CJN.11491015>, 2016: 893–900.
- 59) Simatupang T.M and Sridharan,R. "An integrative framework for supply chain collaboration." the international journal of logistics management, 2005: 1-16. Smits, W., Buiten, M. Van, & Hartmann, T. "Yield-to-BIM : impacts of BIM maturity on project performance." Journal of Building Research & Information, 3218(June). <https://doi.org/>, 2016: 1-19.
- 60) Wang, Y., Liu, Y., & Canel, C. "Process coordination , project attributes and project performance in offshore-outsourced service projects." International Journal of Project Management, <https://doi.org/10.1016/j.ijproman.>, 2018: 980-991.
- 61) Wiese, C. W., & Florida, C. Teamwork and Team Performance Measurement. (Second Edi, Vol. 24). Elsevier. <https://doi.org/10.1016/B978-0-08-097086-8.22017-5>, 2015.
- 62) Yang, J. "Knowledge integration and innovation: sucuring new product advantage in high technology industry." jornal of high technology management research, 2005: 1-14.