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Reducing operating costs approaches of subcontractors in Thai construction industry

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***Abstract*---**This research aim to 1).compare the important level of operating factors of subcontractor companies in construction industry classifier by general information of respondents 2) Finding reducing operating costs approaches of subcontractors in Thai construction industry. The research found that:1)there was not significant different of the important level of operating factors of subcontractor companies in construction industry classifier by position, age rage, work experience of respondents. 2) the reducing operating costs approaches of subcontractors in Thai construction industry were reduce the waste of inventory, transportation does not add value, defects from construction work, waiting time, non-utilized talent employees, motion of employees, these factors jointly prophesy 60.1 % , at statistical significance level of .05.

***Keywords*---**reducing, operating costs, subcontractors, construction industry.

Introduction

The construction industry is expected to recover over the next 3 years, with total construction spending forecast to rise by 4.5-5.0% in 2021 and then by 5.0-5.5% in 2022-2023. A major driver will be public-sector spending on infrastructure megaprojects, especially in the Eastern Economic Corridor, where investment in government-backed projects will encourage crowding-in of private-sector investment (e.g., in industrial estates). Beyond this, the gradual recovery of the

Thai economy will also support greater investment in residential accommodation and commercial properties. And, there will be new opportunities in neighboring countries as their governments continue to improve national infrastructure in response to continued economic growth and urbanization.

The construction industry plays a significant role within the Thai economy. From 2009 to 2019, construction spending accounted for an average of 8.1% of gross domestic product (GDP) annually. The industry is primarily driven by the domestic market. Construction work is split by value at a ratio of 56:44 between public and private construction spending. (Taned Mahattanalai ,2021) However subcontractor of a large construction companies in Thailand are predominantly family-run businesses with limited access to capital. They also operate from a much weaker bargaining position when it comes to dealing with suppliers. Most will take on sub-contract jobs from large players, especially for government megaprojects. They would also seek additional sources of revenue, such as by offering from repair and renovation services.

The subcontractors' operation strategy emphasizes to producing or construction at a very low per-unit cost for large construction companies who are price sensitive. Low-cost strategy puts importance in an increment in organizational performance. It includes the construction process by subcontractors which the company is capable of producing or construction and services with a lower cost than the competitors. The low-cost strategy is a successful way to realize stable competing advantage through reducing and controlling the cost and as a result raising organization performance. According to Griffin low-cost strategy is a strategy in which an organization attempts to gain a competitive advantage by reducing its costs below the costs of competing firms.(Griffin RW,2015).

This was the reason that aroused our curiosity to research the reducing operating costs approaches of subcontractors in Thai construction industry via Lean Operation System is a flexible system of operation that uses considerably to reduce total costs by eliminate waste, and time of operating factors. It involve reduce factors: defects from construction work, waiting time, non-utilized talent employees, transportation does not add value, and inventory. Moreover, lean systems tend to achieve greater productivity, lower costs, and shorter cycle times. The findings of this paper enrich the strategic literature by empirical evidence and offer an opportunity for business strategists to choose the path that will provide for their subcontractors to survive, to increase the profit, and to increase the market share.(Chalice, Robert ,2007)

Purpose of the Research

The aim of the research are to:

1. Compare the important level of operating factors of subcontractor companies in construction industry classifier by general information of respondents
2. Finding reducing operating costs approaches of subcontractors in Thai construction industry

Scope of the Research

1. Scope of the content: this research are to study
   The reducing operating costs approaches of subcontractors in Thai construction industry.
2. Scope of the population:
   Data will collects from 385 managers or owners of subcontractor companies in Thai construction industry via simple random sampling.
3. Scope of Location: the research area are in Thailand.
4. Scope of time : January 2021- January 2022

Hyprothesis of the Research

Hypothesis 1: the respondents who have different position, age rage, work experience, have different the important level of operating factors of subcontractor companies in construction industry.
Hypothesis 2: the operating factors of subcontractor companies in construction industry were defects from construction work, waiting time, non-utilized talent employees, transportation does not add value, and inventory affect to reducing operating costs approaches of subcontractors in Thailand construction industry.

Benefit of the Research

Some benefit of the study are addressed as follow

1. To reduce the operating cost of subcontractors in Thai construction industry
2. Enhance subcontractors improve their operating cost.
3. To be an approach for improve operating cost of subcontractors and related business.

Research Methodoloigy

The purposes of this research are to study; the reducing operating costs approaches of subcontractors in Thai construction industry. Research was mixed method, qualitative methodology by in-depth interview of 5 key informants who were managers or owners of subcontractor companies in construction industry via semi structure questionnaire from lean operation system and integrated relevant research to make questionnaire, and focus group to completed reducing operating costs approaches of subcontractors in Thai construction industry. Data were collected from 385 managers or owners of subcontractor companies in construction industry via simple random sampling. Quantitative methodology, are carried out by questionnaire and analyze via computer software packages, statistic treatments were frequency, percentage, means, standard deviation, One way ANOVA and multiple regression analysis of statistical significance level of .05.

Conclusion

The result of this research were as follow

Hypothesis 1 There was not significant different of the important level of operating factors of subcontractor companies in construction industry classifier by position, age rage, work experience of respondents.
Hypothesis 2: The operating factors of subcontractor companies in construction industry affected to reduce operating costs approaches of subcontractors in construction industry in Thailand
Ho: The operating factors of subcontractor companies in construction industry were affected to reducing operating costs approaches of subcontractors in construction industry in Thailand
H1: The operating factors of subcontractor companies in construction industry were affected to reducing operating costs approaches of subcontractors in construction industry in Thailand

Hypothesis tested by Multiple Regression at statistical significance level of .05.

Table 1 R and Std. Error of the Estimate of the operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.616	.608	.601	.321

From Table 1 R and Std. Error of the Estimate of the operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry found that: The operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry coefficient Adjusted R Square =.601 or .601 x 100 = 60.1 % That mean the operating factors can forecast reduce operating costs approaches of subcontractors in Thailand construction industry of 60.1 %

1) Std. Error of the Estimate mean that Standard Deviation of The operating factors affected to reduce operating costs approaches of subcontractors in Thailand construction industry of .321

Table 2 Standard error independent of operating factors (Durbin-Watson) and relationship between of operating factors (VIF)

Operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry	SD.	Mean	Durbin-Watson	VIF
1.Defects from construction work	.4021	4.12	1.9	1.796
2.waiting time,	.2850	4.17	2.7	1.355
3.non-utilized talent employees	.1188	4.14	4.8	2.671
4.transportation does not add value,	.2113	4.19	3.9	1.560

5. inventory	.6122	4.20	2.5	3.588
6.Motion	.3470	4.16	4.6	4.760

From table 2: Standard error independent of operating factors (Durbin-Watson) and relationship between of operating factors (VIF) found that :

1) Coefficient of Durbin-Watson = 3.15 between 1.9 and 4.8 show that there were not relationship between Standard error of operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry construction (Oh. K, 2014)
2) Coefficient of VIF between (1.355 and 4.760) less than 10, show that there were not relationship between of operating factors (Oh. K, 2014)

Table 3 Coefficients of operating factors affected to reduce operating costs approaches of subcontractors in Thai construction industry by Multiple Regression

operating factors affected to reduce operating costs approaches of in Thai construction industry	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig
1.Defects from construction work	.701	.052	.690*	1.452	.012
2.Waiting time	.686	.094	.624*	1.653	.023
3.Non-utilized talent employees	.645	.051	.611*	3.098	.025
4.Transportation does not add value	.782	.133	.720*	1.145	.016
5. Inventory	.911	.211	.891*	1.987	.019
6.Motion of employees	.597	.821	.571*	1.061	.006

R square adjust = =.601 R square =.608, Durbin-Watson = 3.15
Standard error of the estimate = .321
Note *Statistic Level .05

From table 3 Reducing operating costs approaches of subcontractors in Thai construction industry=.891inventory + .720Transportation does not add value +.690Defects from construction work+ .624Waiting time+ .611Non-utilized talent employees+ .571Motion of employees, these factors jointly prophesy 60.1 % , at statistical significance level of .05. After construction reducing operating costs approaches of subcontractors in Thai construction industry the researcher bring it to made a focus group with 5 executives of subcontractor companies and 5 customers to consider and complete reducing operating costs approaches of subcontractors in Thai construction industry the result as follow

Dicussion

Subcontractors who want to bring or applied the reducing operating costs approaches of subcontractors in Thailand construction industry they must reduce:

Inventory: the customer will not pay you more for your work if you hold more inventory, and will also not pay you less if you manage to meet his delivery expectations with less inventory. Subcontractor must reduce as buffer to compensate for variation in customer demand that it should always be considered to be waste and be minimized cost of inventory. According to research of Jinagool, D. (2019) “Cost Reduction in Work Processes through LEAN” found that effective and efficiency inventory management can reduce costs of operation and in other jobs.

Transportation does not add value: subcontractor should consider to reduce the time spent moving materials and products around your plant or from location to location especially necessity if you have a large site or multi-site operation, but it does not add value to the product and is therefore categorized as waste. According to research of (Jinagool, D. ,2019). “Cost Reduction in Work Processes through LEAN”, found that reduce transportation does not add value in term of material, equipment, spare part and other can reduce time and cost of operation .

Defects from construction work: subcontractor should consider to reduce the defect of construction work, improve their procedure, working process, and quality control in each step to meet the standard and equipment of customer. When there is a problem or with construction work it must to find the course and effect and get feedback information for improve and collection that problem. Should be considered waste of defects from construction work seriously. According to research of (Jinagool, D. ,2019). Cost Reduction in Work Processes through LEAN, found that continuous quality improvement can reduce defects from work and reduce cost of operation.

Waiting time: subcontractor should consider to reduce waiting time is the unproductive time spent by employees waiting for something to happen. Often they will be waiting for another employee to complete his or her task or waiting for a machine to complete its cycle. While waiting, the worker is not adding value to the product and therefore waiting is waste. According to research of (György Kovács,2020). “Combination of Lean value-oriented conception and facility layout design for even more significant efficiency improvement and cost reduction” found that one factor that effected cost reduction by reduce waiting time on working process.

Non-utilized talent employees: subcontractor should consider to reduce the waste of non-utilized talent is not recognizing and effectively utilizing the valuable skills or talents that your employees could bring. According to research of (Todorut, A V., 2015). "Sustainable cost reduction by lean management in metallurgical processes” found that utilized talent employees was sustainable cost reduction by lean management in working processes.

Motion of employees: subcontractor should consider to reduce in many tasks, employees will spend a lot of their time walking. Walking from one part of a production line to another, walking back and forth to collect or deliver materials, or walking around their work cells. While walking, employees are not adding value to the customer, so motion is waste. According to research of (György Kovács,2020). “Combination of Lean value-oriented conception and facility layout

design for even more significant efficiency improvement and cost reduction" found that workplace ergonomics via motion of worker can reduce time and cost

Suggestion

Subcontractors who want to bring or applied the reducing operating costs approaches of subcontractors in Thailand construction industry they must consider to reduce the waste in working construction process were defects from construction work, waiting time, .non-utilized talent employees, transportation does not add value, inventory and motion of employees, these factor leading to cost reduction in construction working process.

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