

Lean Design Management In Kuwait During Covid-19

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Abstract:- This paper has been prepared to explore the lean design management in Kuwait during Covid-19. A questionnaire survey has been carried out from a wide range of professional engineering consulting practitioners operating in Kuwait. The findings from this research explored the principles, techniques and tools of lean design management in Kuwait during Covid-19. The main conclusion drawn is that the TVD technique were always used in lean design management in Kuwait during Covid-19.

Keywords:- Lean design management, Kuwait, Covid-19, Survey questionnaire, Telephone interview.

Introduction

City in Kuwait called Al Mutlaa, it is located in the west-northwest of Kuwait City. this upcoming city with 12 residential neighbourhoods for Kuwaiti citizens as well as expatriates. The new city (Al Mutlaa) offers a range land uses including two district centers, commercial core and city center. However, many construction projects suffer from a range of management problems such as delays in construction projects and uncertainty in terms of cost can also lead to unhappy customers with the final product. Therefore, design process must produce those requirements from a careful identification of customer needs.

The design process on construction projects is complex; sometimes it involves thousands of decisions over a period of times, with numerous complexities under a highly uncertain environment. For these reason, lean design management (LDM) has been used by practitioners in order to manage the design process in construction projects.

LDM is the outcome of blending the main principles of lean with established practice in design management. Several studies were identified some characteristics of a lean design process as follows:

1. Involvement with clients at early stage.
2. Identifying customer needs.
3. Eliminating the waste in the design process.
4. Pull value by thoroughly establishing both process design and product design.
5. Making design decisions at manufacturing steps so as to consistently reduce the amount of information, time, and the number of stages required in serving customers.

Furthermore, another lean techniques and tools are often uses in lean design management such as Building Information Modeling (BIM), Set Based Design (SBD), Target Value Design (TVD), Last Planner System (LPS) and the Choosing By Advantages (CBA) in order to realising lean principles in practice.

Now that the introduction has been detailed, a brief overview of Covid-19 followed by the research method will be detailed. Then, the findings of this research will be analysed and a conclusion will be given at the end of this research.

The Covid-19

Previous studies mentioned that the coronavirus (COVID-19) was explored in December 2019, in Wuhan, China among a cluster of patients with viral pneumonia who had visited the Huanan seafood market. According to Nature, the coronavirus (COVID-19) is becoming a pandemic due to more than 100 000 people in 100 countries having been infected. As a result, the COVID-19 has created a wide range of reactions from governments. Common measures include bans on public gatherings, travel restrictions, school closings, new forms of social welfare provision, emergency investments in healthcare facilities, the augmentation of health systems, managing the economic consequences of these actions, contact-tracing, and other interventions to contain the spread of the virus. Therefore, this paper aims to explore what the principles, techniques and tools are used in lean design management in Kuwait during Covid-19. The objective was to gather the information from a wide range of professional such as engineers, project managers, design managers and architects practitioners.

Research Methodology

The research methodology used in this research is a questionnaire survey to collecting data from a wide range of professionals. The questionnaire was sent to 105 engineering consulting sector practitioners working in Kuwait. The questionnaire was launched between 5th of February 2021 to 7th of April 2021. A total of 43 completed questionnaires were received. The responses were from: 21 engineers, 8 project managers, 8 design managers and 6 architects, as shown in Figure 1. Additionally, a total of 10 practitioners completed telephone interviews.

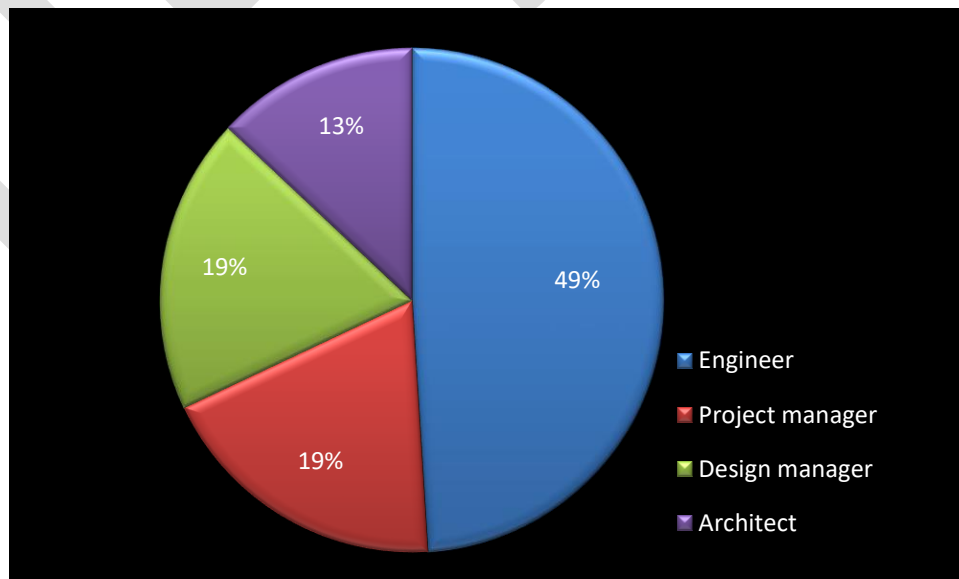


Fig 1:- Respondents' profession or current role.

Findings

The majority of the respondents (53.49%) worked for small organisations. The annual turnover for 83.72% of the surveyed companies was less than £1.5m, while the annual turnover for 16.28% was between £1.5m and £7.5m. Respondents were involved in a variety of projects in the commercial and industrial, new builds and/or refurbishment, and housing sectors. Respondents also had experience in both private and government sectors. The main findings of the questionnaire survey are presented in Table 1 and 2.

Table 1:- The importance of business principles in their organisations during the design process.

| Business Principles | Very important | Important | Do not know | Not very important | Not at all important |
|--|-----------------------|------------------|--------------------|---------------------------|-----------------------------|
| Defining "what customers want" e.g., activities to be delivered and the price for each afford given. | 7.14% | 90.48% | 2.38% | 0% | 0% |
| Identifying all the design process activities that should be achieved the goal from what the customer's want as well as reducing the cost that do not add value to the customer. | 36.59% | 63.41% | 0% | 0% | 0% |
| Make all the steps run smoothly without delays or interruptions. | 60.98% | 39.02% | 0% | 0% | 0% |
| Let "what customers want" from the upstream activity to ensure their goals of flow and pull value. | 2.44% | 24.39% | 7.32% | 65.85% | 0% |
| Ensure all the design process activities are completed to satisfy the needs of perfection. | 41.46% | 58.54% | 0% | 0% | 0% |

Table 2:- Practices associated with specific techniques.

| Techniques | Always | Sometimes | Do not know | Not very often | Never |
|--|--------|-----------|-------------|----------------|-------|
| My organisation engages deeply with the customer to establish the target value for every design process. | 92.68% | 7.32% | 0% | 0% | 0% |
| Every project is design using a BIM technology in my organisation. | 2.44% | 90.24% | 0% | 2.44% | 4.88% |
| We concurrently design process activities in design set. | 2.44% | 92.68% | 4.88% | 0% | 0% |
| My organisation encourages the use of correct data as well as using data correctly for basing decision. | 12.2% | 85.37% | 2.44% | 0% | 0% |
| We weekly work to ensure that work can actually be performed. | 24.39% | 75.61% | 0% | 0% | 0% |

Discussion

Table 1 was based on the importance of business principles in their organisations during the design process to optimise customer value. The results showed that the majority of the respondents (90.48%) were indicated that the defining “what customer want” e.g., activities to be delivered and the price for each afford given is the most important of business principles in their organisation, 63.41% of the respondents were indicated that the design process activity in their organisation should be achieved the goal from “what customer want” as well as reducing the cost that do not add value to the customer, 60.98% of the respondents were indicated that all the activity steps in their organisation should be run smoothly without delay or interruptions and 58.54% of the respondents were indicated that all design process activities in their organisation must be completed to satisfy the need of perfection. However, the results in Table 1 showed that the majority of the respondents (65.85%) were indicated that the business principle is not very important for allowing “what customer want” from the upstream activity to ensure their goals of flow and pull value in their organisation. Based on the telephone interviews, it was because of the municipality’s laws in Kuwait for construction projects.

Moreover, practices associated with specific techniques, such as TVD, BIM, SBD, CBA and LPS were considered in this study in order to realising lean principles in practice, as shown in Table 2. The results showed that the respondents of 90.24%, 92.68%, 85.37% and 75.61% were sometimes engages to other techniques such as BIM, SBD, CBA and LPS, respectively, in their organisation.

Furthermore, the results in Table 2 showed that the majority of the respondents (92.68%) were always engages deeply with the customer to the target value for every design process in their organisation. Therefore, the TVD is the most important techniques in lean design managemtn in Kuwait during Covid-19.

CONCLUSION

This study explored the business principles, techniques and tools used in lean design management in Kuwait during Covid-19. The main conclusions of this paper are summarised as follows:

- The business principle of “what customer want” from upstream activity to ensure their goals of flow and pull value is not very important in their organisation in Kuwait during Covid-19. This was because of the municipality’s laws in Kuwait for construction projects.
- The TVD techniques and tools were always used in lean design management in Kuwait during Covid-19.

Clearly, further research is required to develop a better understanding. For example, a case studies are needed to test the overall lean design management within construction projects in Kuwait during Covid-19, and beyond.

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