Impact of Information Technology for the Success of Construction Sector of Sri Lanka, Especially during the COVID-19 Pandemic

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Abstract. The ongoing global pandemic of the COVID-19 which was first identified in Wuhan, China, has impacted many sectors due to country lockdowns, travel restrictions, etc. Many health regulations have been presented by the Ministries of Health on how to conduct work safely. The construction sector in Sri Lanka is one of the major industries that have been impacted by the pandemic. This study was conducted to understand the impact of IT on the success of the construction sector in Sri Lanka, especially during the pandemic. The research was conducted as a qualitative data collection approach, where the researcher collected data from a group of sector professionals. The study revealed some of the important aspects and uses of IT in the construction sector in Sri Lanka and the same were justified by using secondary data.

Keywords: Information technology, Construction Sector, Sri Lanka, COVID-19 pandemic

Introduction

The construction sector of Sri Lanka is identified as being contributing approximately 7.4% to the GDP of the country and is said to be providing employment opportunities for more than 600,000 workers. This includes both direct and indirect employment opportunities, within the sector (The International Trade Administration, U.S. Department of Commerce, 2021). During the past few years, the construction sector has experienced developments in many large-scale construction projects, commercial developments, and many other infrastructure projects since the year 2010. Further, the turnover from the construction sector is identified as being over 4.3 Bn USD annually and this includes revenue that is generated by both local and international construction companies that are operating in the sector. There are many large scale infrastructure projects that is under construction, including the Port City construction, which is developed on the newly claimed land in Colombo (Jayalath & Gunawardhana, 2017).

However, it is identified that the economic slowdown in the country due to COVID-19, which was identified as a global pandemic, in the year 2020, is said to have impacted many of the ongoing construction projects in Sri Lanka (Pathirana, 2020). Due to this reason, it has been identified that information systems are used within the sector, to ensure proper communication of information among all stakeholders.

Accordingly, this study is conducted to understand the impact of information technology (IT) on the success of the construction sector in Sri Lanka, especially during the pandemic.

Materials and Methods

The study that is conducted is considered to be a qualitative study. Due to travel restrictions being imposed in the country, the study was conducted by using an online open-ended questionnaire that was distributed among a selected group of 50 sector professionals.

All respondents of this survey had over 5 years of working experience in the sector and approximately 40% of the interview participants had over 15 years of working experience in the sector.

Results and Discussion

Information technology can be defined as a network within an organization or sector that will safeguard data and information, through the creation and administration available databases, that are available, while supporting employees in troubleshooting problems that may exist in the work environments (Saleem, et al., 2013). Further, a combined IT system within an organization will cater towards effective management of the organization, hence resulting in success in the organization or sector at large (Farhanghi, et al., 2013).

Research has identified that IT can reduce most of the transactions and agency costs that are experienced by organizations. This is mainly because many of the transactions can take place online, thereby reducing many of the costs that will be incurred during manual transactions (Jafari, 2014).

Further, it was discovered through previous studies that have been conducted in the construction sector, that technology has made sites safe for the workers, while at the same time making them more efficient (Mihić, et al., 2019). Studies identify that such developments in the construction sector allow construction sites to increase their productivity levels while improving collaboration among all stakeholders of the construction project (Clarke, et al., 2003). It is identified that using IT is critical especially when tackling complex projects because these projects will have many stakeholders involved and is expected to manage all of them effectively (Collinge, et al., 2009).

Another study related to the research area states that IT will also support construction development projects in the entire management during the lifecycle of the project. Some of the key functions of IT relates to the storage of information, assisting in structural designing and cost estimation, management of on-site activities as well as the administration of the facilities within the construction project (Skibniewski, 2014).

Finally, it has been identified that with the COVID-19 pandemic, management of construction projects has been difficult mainly due to the health risks on the construction workers, possible lockdowns, travel restrictions, etc. (Chaisaard, et al., 2020). Therefore, the importance of IT and its impact within the construction sector is identified, more than ever.

The researcher conducted a survey that included open-ended questions. The responses received in this study are presented below.

To obtain an understanding of the demographics of the respondents of this study, the researcher has prepared the table below, that summarizes these details.

Table 1. Demographics of the respondents

Demographics	Details
Gender	Male – 80% Female – 20%
Years of experience in the sector	5 to 10 years – 11% 10 to 15 years – 45% Above 15 years – 44%
Province	Western – 40% Central – 20% Northern – 15% Eastern – 15% Other – 10%

Based on the above demographics analysis, it can be identified that most of the respondents of this study are male and approximately 40% of the respondents had over 15 years of working experience. Further, the researcher approached sector professionals from the Western province mainly because most of the ongoing large-scale projects are taking place in the Western province.

The researcher also opened the survey for discussion, with the sector professionals on the impact of IT on the success of construction projects, especially at a time the country is facing the COVID-19 pandemic. The chart below provides a summary of the main points that were raised by the participants.

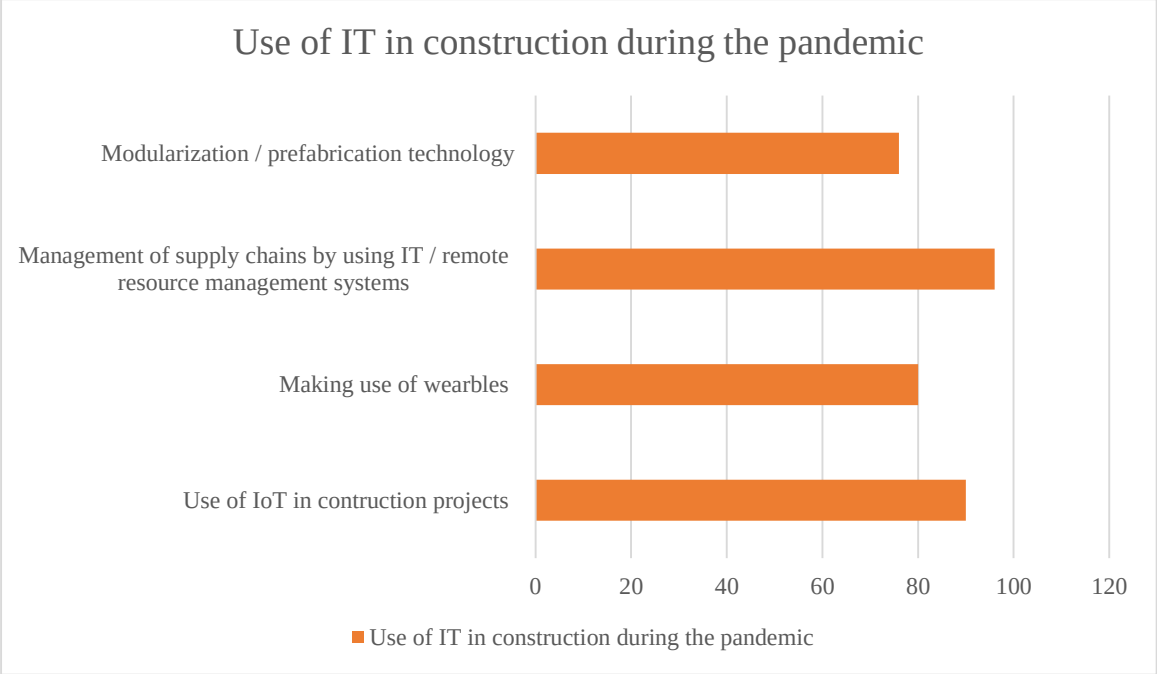

Figure 1. Summary of respondents on the use of IT in the construction sector

As shown in the chart above, the first important aspect of IT that was identified is the use of the Internet of Things (IoT) in construction project activities. Research has identified that the tech world today, is reliant on the idea of improved connectivity that can be achieved through IoT (Angelova, et al., 2017). During the data collection, it was identified that IoT is used as a technique that will improve the efficiency of the operational functions of a project, while at the same time improving the safety of construction sites. One of the main concerns that contractors have during the pandemic is ensuring the health and safety of the workers and thereby creating a working environment that is safe for the workers. IoT can assist in the implementation of social distancing strategies within the suite, while at the same time keeping track of all operational activities that take place within the site, through the use of IoT-enabled sensors and technologies.

Although limited in use, in the Sri Lankan construction sector, another important use of IT in construction projects is the use of smart wearables. Research has identified that the use of wearables can help in biometrics and will also assist in identifying the health conditions of the workers (Awolusi, et al., 2018). It was discussed that such technology can be used to track the health and the safety of the workers in a project, while also being able to notify employees if they come too close to other workers on the site. Further, the overall system will also assist the contractor to be able to monitor the overall health situation of all workers.

The use of IT when managing the supply chains of a project and the use of remote resource management systems is another advancement that is identified by using IT in the

construction sector. Being able to manage the supply chain from any location through the use of developed IT systems is one of the important developments that is practiced by many construction projects (Varma & Khan, 2014). It was disused that tackling resource-related issues have always been an issue in the management of construction projects during the pandemic. Therefore, the importance of using systems that will enable remote working was identified as one of the important aspects of IT usage in the construction sector during the COVID-19 pandemic.

Another development in the construction sector that is identified through the developments of IT is modularization and the use of pre-fabricated products within the sector (Gunawardena, et al., 2016). Many construction companies that are operating today have been able to identify the benefits of being able to do better in a controlled working environment, away from construction sites (Jiang, et al., 2019). One important benefit is that construction activities could take place, even at times when weather conditions are unfavorable. During the data collection process it was discussed that with the COVID-19 pandemic, the pressure of completing projects within the timeline is experienced. Contractors must consider the use of modularization or pre-fabricated construction components within projects, through the use of IT. Further, this was highlighted as an area that will see growth within the construction sector in the near future.

Conclusions

The construction sector in Sri Lanka is one of the main industries that is able to contribute to the GDP of the country. The sector has created many jobs for many workers. However, with the outbreak of the pandemic in the year 2020, the sector has experienced many challenges in continuing construction site-related operations, while ensuring the health and safety of the workers.

A qualitative research was conducted among a chosen group of 50 sector professionals, to understand the impact of IT in construction projects, especially during a pandemic. Through this discussion, the researcher was able to reveal some of the important uses of IT in the construction sector. These findings were discussed along with secondary data.

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