Abstract

Construction is an industry that is very closely linked to the economy and society as a whole. As such, when developing an understanding of the future of the construction industry, it is important to understand the future of the economy and society as a whole.

It is important for organizations within the construction industry and institutions for construction education to remain constantly aware and knowledgeable of the state of the future. The world is changing very fast. A wide range of trends and challenges have a direct bearing on the future of project management. It is very vital to understand those trends, so that the risks can be better managed for construction industry and make the most of emerging opportunities. Project-based work is characterised by high degrees of collaboration. Innovation and creativity are the key components of value creation. Employee expectations and working cultures are changing all the time.

The main drivers affecting project management are across social, cultural, environmental, economical, legal, political and technological (SCLEEPT) domains. These domains have to be understood, evaluated and planned strategically for the future. These domains impacts on future work environments, professions and project management approaches.

The complex and fragmented nature of the construction industry and the challenges ahead call for different approaches and different innovative tools to succeed in an unpredictable and changing environment. Future studies is to support long-term planning.

The aim of this paper is to understand in what extend the topic foresight is being addressed in construction project management literature. It is actually an overview of the phenomena.
Introduction

The management of construction projects requires knowledge of modern management as well as an understanding of the design and construction process. Construction projects have a specific set of objectives and constraints such as a required time frame for completion. A project organisation will generally be terminated when the mission is accomplished.

Silva (2015) study covers a systematic review of foresight in project management literature. This study demonstrates that foresight research in project management literature is in its infancy and is characterised by a limited number of studies and a relative absence of theoretically informed research. It is concluded that future research is strongly needed.

Foresight appears as an emergent practice and its use is worth considering in the context of project, programme and portfolio management. In their study Uchipte et al. (2016) stressed to formulate a means of predicting potential areas of research or emerging knowledge that could arise in the foreseeable future. Being able to predict the future for project management field is very encouraging since it is continuously growing and becoming vital in the construction industry. Coelho (2012) state that no project can succeed without an experienced project manager. Any project manager must be well-equipped with and utilise the right tools, appropriate to the project, in order to successfully guide a project to success.

The proper information about the future direction of the construction industry will better prepare project managers to know which tools and techniques need to be learned and applied to resolve the unexpected and expected problems in the industry and its projects. The study of Uchipte et al. (2016) certainly indicates that there is a vast future for researchers and the industry in general.

Rivera and Kashiwagi (2016) state that project management is the mechanism to delivering professional services and project managers are responsible for managing, directing and controlling projects. The main objectives of a project manager is to deliver a project on time, on budget and customer satisfaction. Besides a project manager must align all resources and ensure quality control on site work.

There are always difficulties delivering services on time, on budget and with customer satisfaction. The literature identified that the industry has struggled with overcoming poor delivery of services, and has not seen any significant improvement in the last three decades, despite the increase in professional education and training (Egbru, et al. 2008; Goff, 2014). This is interesting, because not only will there be more projects in the next 30 years (CII, 2015), but projects have become larger and more difficult to manage due to the increasing number of participants, the increasing importance of legal contracts (Kashiwagi, 2013), and all the participants in the supply chain
segmented in silos, resulting in an increased level of complexity. According to Construction Industry Institute study done in 2015, it successful in terms of scope, cost, schedule and business; 30% of projects completed within 10% of planned cost and schedule; 25 – 50% waste in coordinating labour on a project; management inefficiency costs to owners between 15.6 and 36 billion US dollars/year; rework by contractors is estimated to add 2 – 20% of expenses to a contractor’s bottom line and an estimated 4 billion US dollars to 12 billion US dollars is spent to resolve disputes and claims (Lepatner, 2007; PwC, 2009 and Yun, 2013).

Rivera and Kashiwagi (2016) express their concern about the non-performance of the overall construction industry and identified the following three potential solutions:

1. The lean management approach:
   This is known as a set of principles and techniques that assist organisations in eliminating wasted efforts and increasing likelihood to meet customer satisfaction. They argue that in this approach the owner’s management, direction and control is not minimised.

2. The agile project management approach:
   This breaks up a project into smaller components, utilises partnering between all stakeholders and lessons learned can be quickly implemented into the project’s other components. It is argued that the downside of this approach is that it does not minimise the owner’s management, direction and control (MDC), which is a source of project cost and time deviation.

3. The Best Value Performance Information Procurement System Methodology (BV PIPS):
   This is a non-traditional procurement/project/risk management model proposed by Dean Kashiwagi in 1991. It has been found to increase the efficiency of delivering services up to 40% while simultaneously reducing project management up to 79%. According to Rivera and Kashiwagi (2016) this is the most dominant solution based on the extensive performance documentation and impact in industry. They argue that, BV PIPS has the ability to minimise management, direction and control resulting in decreased costs on average 31% and 98% customer satisfaction. In this approach the role of project manager is shifted from being an expert to utilising expertise.

**Construction Trends**

1. Building Information Modelling (BIM):
   Building Information Modelling (BIM) as stated in Gorecki and Czaplewska (2017) is considered as the innovation that allows for the
consistent management of information in the construction projects. This tool is also useful in managing the process of building construction in the whole-life cycle perspective. BIM takes into account the most crucial thing in a construction project: Collaboration.

2. Real-time project management:
Real-time project management is improving and optimizing the fundamental pillars of a construction project. Its contribution to the building process is critical. Real-time project management software empowers transparency, accountability and efficiency in construction.

3. Virtual Reality (VR) and Augmented Reality (AR):
VR is able to provide virtual walk through in order to sell property and pitch architectural ideas to clients. In construction, it can be effectively used to provide safety training to workers. It enables easy communication on site. VR is more common in construction.
AR’s basic essence is to enhance what we see through data and information. AR can provide accurate measurements, material details and reduce the risk of errors. (Example: DAQRI augmented reality technologies empower employees with next generation productivity – DAQRI Helmet).
The era for virtual reality will come. Construction is becoming more data focused. It is expected more and better use of augmented reality (AR) in construction in future.

4. Drones:
Data collected from drones can be used to analyse the progress of the project. The job, through drones, can be done faster and less costly. Usage of drones is expected to grow rapidly in future.

5. Sustainable and Green Construction:
Green construction reduces waste and the use of resources. In future there will be more need for green construction. Green construction is going to force construction managers and constructor to change their business model.

6. Improved Labour:
With improving technology there will be more intelligent labour in construction. Construction will need knowledge workers and people with skills to create, operate and maintain the advanced technology in construction.

Cloud – Based Project Management
Mobile devices are revolutionizing the construction industry with cloud based project management providing real productivity improvements on jobsites. Both
cloud computing and mobile computing involve accessing the Internet with a device and using wireless systems to get to your files and data. According to a 2016 study from Associated General Contractors of America (AGCA, 2016) and Sage, 59% of construction firms surveyed had plans to use or already used cloud based project management software, leaving over 40% of companies virtually in the dark. A thorough understanding of how cloud technology enhances a construction project is critical to implementing the right software on the job.

Cloud computing and mobile computing are two very different components, but when they are used together, they allow you to work or access the data you need from anywhere that has a working wireless connection. The easiest way to tell the two apart is by the role they play in communication:

- Mobile computing includes the device you use to access the internet and could be a phone, tablet or laptop.
- Cloud computing is the virtual storage space that holds your applications, files and data and allows you to securely access it when you need to.

“Mobile computing” is a broad term that describes the different types of devices that allow you to access the Internet and your personal and work data, no matter where you are in the world. Mobile computing improves your connectivity, allows workers to perform tasks from home, from across town or even around the world with ease. Mobile computing also increases connectivity.

“Cloud computing” actually refers to the storage space that holds your data, applications, images and more securely in place until you need to access them. One of the most valuable aspects of devices powered with cloud is the ability for you to switch devices and have the same information.

As construction sites become more high-tech and the people managing them become increasingly connected, more industry professionals will likely shift toward implementing a cloud based strategy for data storage and sharing. That capability will allow project teams to streamline operations, giving each user the up-to-date data they need in real time—a process that, ultimately, will help compress any lag in information sharing and decrease the potential for error (Construction Dive, 2018)

The enhanced collaboration provided by cloud based project management makes it easier and more efficient than ever for teams to work together.

**Summary**

All managers have something they can continuously improve on. Just like the construction industry itself, construction management is evolving. Successful project managers will know how to adapt their skill set to meet the current need of the market and their employees. Furthermore, being an effective manager will
not only benefit your employees and your own job security, but it helps to ensure your projects run smoothly and effectively. Basic project managers have the qualifications and experience to manage the day to day of construction. Great managers have both the qualifications and expertise but know how to see the bigger picture and adapt. Most importantly, effective and adaptable project managers will be more adept to handle management of large-scale megaprojects.

REFERENCES


