



Creative Construction Conference 2019, CCC 2019, 29 June - 2 July 2019, Budapest, Hungary

The Future Role of Facilities Managers in an Era of Industry 4.0

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Abstract

The job description of asset and facilities managers continue to evolve. The future roles of facilities managers is somewhat a concern, given the trend and progression of innovative technologies in recent times. This study sought to evaluate the perceptions of built environment practitioners, involved in management of infrastructure during operations, regarding the influence of technological innovation on the future roles of facilities managers in terms of sustainability. An interview guide was used to solicit information regarding the future roles and responsibilities of facilities managers. The interviews were conducted with five facilities management practitioners selected purposively and conveniently based on knowledge, willingness and ability to participate in the study. Themes on the influence of innovation on facilities management practice and future adaptive roles of facilities management were evinced. These findings are envisaged to be useful in developing new strategies and directions to equip and accord facilities managers with the necessary techniques to adapt in this ever-changing era of technology and innovation.

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Peer-review under responsibility of the scientific committee of the Creative Construction Conference 2019.

Keywords: Facility managers, innovation, Johannesburg, technology.

1. Introduction

Facilities management as an industry has its roots as far back as the 1970s in the United States and the 1980s in the United Kingdom and Europe [1]. Globally, the facilities management sector is worth \$1.1 trillion per annum, in economic terms [2]. In the United Kingdom alone, the sector is reportedly worth more than \$1.0 billion yearly [1]. Increasing awareness of and appreciation of facilities management has led to an exponential growth of the industry globally, which is now worth an estimated \$900 billion, with an annual compounded growth of over 8% expected by 2025 [3].

Facilities management is a strategically integrated approach to maintaining, improving and adapting building and support services of an organisation in order to create an environment that strongly supports the many objectives of the organisation. This inter-disciplinary field is also devoted to the management and coordination of space, infrastructure, organisation and people. Therefore, facilities managers are authorities in the built environment industry.

Typically, the duties of a facilities manager entails general upkeep and management of facilities, refurbishments, budgeting and cost control, record-keeping, project management, and others. Overall, facilities management supports business value and contributes to the delivery of an organisation's strategic and operational goals, both in the long and short run [4]. The facilities manager's job title may therefore differ in different organisations. However, with the continuous innovation and development of facilities constantly under pressure to reduce costs and at the same time add value to an organisation, the role of facilities managers has continued to evolve. Other challenges faced by the facilities management industry globally include workplace changes, occupational health and safety and reporting requirements, information systems management needs, cost-effectiveness, integrated facilities management services and innovation [2]. The situation is somewhat compounded by technological advancement and digitalisation fervour that the fourth industrial revolution (4IR) era has brought.

The 4IR is where the tools of technology can become literally embedded within us and even purposefully change who we are [5]. It brings about innovation that risks creating forms of conflict. This suggest that all stakeholders have to work together to improve innovative governance and commercialisation approaches, which synergise with the current and emerging technologies. The fourth industrial revolution, which is characterised by the fusion of technology that continuously builds and extends the impact of digitalisation in everyday life and applications, can play a role in ensuring sustainability of the facilities management role. The technology-driven changes and advances, which merge the physical and digital worlds, can create both huge promise and potential peril, but it forces a rethink on how organisations create value [6]. Therefore, continuous research on how facilities management can be sustained in future requires attention.

Previous studies on the trends and predictions of the facilities management practice have focused on issues around the pros and cons of in-house versus outsourced management models and the innovative nature of the outsourced model [7]. Other research have included biological and environmental initiatives that tally with the 4IR to improve productivity [8], [9]. Other studies focused on the changes and associated challenges in facilities management practice, at the corporate and government levels in Malaysia [10] and ways to improve preparedness in facilities management practice by increasing awareness of the facilities management career path, and thus the number of professionals [11]. On his part, [1] espoused that one of the ways to improve the facilities management sector standing is through the creation of more industry standards and benchmarks. This can partly be achieved through alignment of standards with developing circumstances. Innovation is high on the agenda in many economies in terms of facilities service delivery, and this is aimed at producing organisation, environmental and technological product innovations. Hence, concerns abound regarding the transformation that the 4IR brings. The 4IR brings unpredictability to the future of work, requiring people's opportunities and well-being to be localised and re-examined [9]. Therefore, the objective of the present study was to investigate the role of the facilities manager given the changing times of new technology and innovations. The findings of the study are envisaged to be beneficial to facilities management practitioners in identifying ways to create an enabling and innovative environment for practice.

The next sections of the current paper present an overview of the facilities management practice and the role of technology in the practice of facilities management. The findings from interviews conducted among facilities management practitioners are presented thereafter and the conclusion drawn from the findings follows.

2. Literature review

2.1 Facilities management roles – An overview

Facilities management is the integrated management of the work environment and supporting services of organisation to provide an enabling environment to achieve a business' primary objectives [12]. The post of facilities manager is both administrative and supervisory. According to [13], facilities management encompasses multiple disciplines to ensure functionality of the built environment by integrating people, places, processes and technology. [14] defines facilities management as “enabler of sustainable enterprise performance through the whole life management of productive workplaces and effective business support services”. The International Organisation for Standardisation

(IOS) defines facilities management as a function which integrates people, place and processes within the built environment with the purpose of improving the quality of life and the productivity of the core business [13], [15].

The facilities manager's title may differ depending on the organogram of that particular organization. Some of the titles include Facilities Manager, Head of Facilities, Facilities and Support Services Manager, Area Facilities Manager, Corporate and Real Estate Services Manager, Facilities Technical Manager, Facilities and Purchasing Manager. These job responsibilities cover various aspects including customer service, environmental issues, project management, and space management, building fabric maintenance procurement, financial management, information management, risk management and others [16]. The facilities manager is duty-bound to sectionalise aspects into management of services, outsourcing, performance measurement, life cycle costing, budgeting and cost control, setting up and maintaining database, environmental complain auditing, and monitoring project processes to aid management at the operational stage. Today's facilities management focuses on organisation's core business and contributes to its bottom-line by reducing costs, improving productivity, generating revenue, and improving its image. However, the future scope of facilities management is considered taking into account organisational factors, current conditions and the impact of future innovation and change. The impact of these factors is reviewed in the next section.

2.2 The future of the facilities management practice and the fourth industrial revolution

In the facilities management world, the roles change with time as customer expectations change regularly. Figure 1 presents the roles of facilities managers over time. From the 1990s, the practice of facilities management has evolved from being just service provider to a business enabler, including functions based on imperatives such as “integrating”, “aligning” and “innovative” (Myeda, 2014). The future generation is therefore faced with more freedom and flexibility and a lifetime of learning and innovation, requiring a change in priorities [4], [17].



Figure 1: Facilities management roles' evolution over time (Source, Myeda, 2014)

Certain factors therefore shape the way facilities management services are delivered. These factors include culture, technological development, current economic conditions, sustainability considerations, health and wellbeing, innovation, and others.

- Workplace culture – The workplace culture to promote corporate identity and foster more efficient collaboration and knowledge sharing is important.
- Technological advancement – The influence of technological advancement has already been felt within the operations of facilities management [8]. Integration of intelligent and digital technologies such as BIM and robots may be expected to carry out some of the functions associated with facilities management in future. The use of more efficient information management systems to store and retrieve data is beneficial. It is vital for organizations to use computerised systems to enhance information transfer and communication to record and monitor costs, for financial budgeting and control.
- Current economic conditions – When economies face hardships, there is greater pressure to maximize value. The more economies struggle, the more competition organisations face.
- Sustainability considerations – The need to incorporate factors such as climate change and energy efficiency of buildings is recognised.
- Health and wellbeing – The focus here is on artificially and technologically advanced human capabilities, which create significant impacts on the facilities management and service industry.
- Innovation – This has become imperative in facilities management practice given the need to improve on corporate image and identity and achieve competitive advantage. According to [7], there is no way around technology and thus innovation has to be a key component of the facilities management business. It is extremely pertinent if a company wants to add value for the clients.

The above factors are envisaged to influence the continual changes which facilities management companies face and which in turn determine the functions they perform. The rate at which people adapt to changes in their work environment depends on the quality of enabling infrastructure and skills development [18]. This suggests that the changes which the 4IR brings will require equipping future facilities management practitioners with the requisite skills needed to face any challenges they might encounter.

The fourth industrial revolution is characterised by the integration of technology that continuously builds and extends the impact of digitalisation in everyday life and applications, can play a role in ensuring sustainability of the facilities management practice [6]. The 4IR refers to how technologies like artificial intelligence, autonomous vehicles and internet of things are merging with human beings [19]. It is characterised by the convergence of the physical, digital and biological worlds and adds an unpredictability dimensionality with the speed of technological advancement [9].

The fourth industrial revolution has the potential impact of promoting predictability and transparency in risk preparedness and responses [18]. The 4IR provides conditions for innovative sustainable inclusion and economic growth, shared prosperity and decent work for all, taking into account different level of development and capacities should be created [20]. 3D printing can better inform decision-making on infrastructure and energy-efficient buildings. Drones can be used to deliver urgent and reliable information on hard-to-reach areas in buildings [18]. Technological advances are drastically changing how individuals, companies, and governments operate, ultimately leading to a transformation, like the previous industrial revolutions. In fact, studies show that technologies will eliminate some jobs, while creating demand for new jobs and skills and this may as well be a source of peril to facilities management practice, as with some other professions [19]. These predictions that automation and technologies will make humans redundant dates back to the First IR, when textile workers protested that machines and steam engines would destroy their livelihoods [21]. This view was however, not shared by [22], in which it was opined that the creation of jobs will be much greater than the destruction of jobs. However, it is critical for facilities management practitioners to harness these technologies in achieving efficiencies and adopting best practices [7]. A company's most important asset is its creative capital, which are the employees who pioneer new technologies, create new industries and structures and drive economic growth on a larger scale [21]. However, without adequate prepared human capital, a country will not be able to harness new technologies [22].

Research reveals that some countries and sectors are unprepared for the 4IR. A study of 10 global cities' readiness to adopt new technologies in Singapore, revealed that only 42% of the surveyed respondents felt ready to adopt new technologies [18]. Industries in South Africa, including the facilities management sector, are not prepared for the 4IR [22]. However, the 4IR, a combination of technologies, is here to stay and has been for a long time. For instance, there is the internet of things (IoT), which is the inter-connective network of physical objects including devices, building, vehicles, software, sensors and others, which allow remote controlling of objects [21]. Therefore, continuous attention to ways of adapting and integrating these new technologies is critical.

3. Methods

A qualitative approach was adopted for the study. Interviews were conducted with five facilities management practitioners. The participants were selected based on convenience sampling of facilities management departments in three organisations, including the university's facilities management department, a hospital and a private facilities management company in Johannesburg, South Africa. Purposive sampling techniques was also used to identify respondents based on their knowledge, willingness and ability to participate. The participants were approached during working hours and requested to participate in the study. Therefore, participants who were willing and able to participate in the study were selected.

The information collected was based on the perceptions of the respondents on the future focus of facilities management practice. The empirical data was analysed using thematic content analysis to identify emerging themes with regard to the changing roles of facilities managers. Themes on the influence of innovation on facilities management practice and future adaptive roles of facilities managers were evinced. The findings are presented hereunder.

4. Findings and Discussion

The participants' perceptions on the future role and responsibilities of the facilities manager in future given the intense pressure brought about by the 4IR. Findings revealed that there was a view that facilities managers will still be required to create value for their clients. This was evinced in statements by the respondents:

"The current change of the industry ...the future facilities managers will be required to be able to design a service delivery system focused on what is creating value to the core organization and how to engage frontline employees....Providing better service experience will become critical success factor for the future facilities management."

"The role of the facilities manager is to target on discovering and defining what it means to create value in the organisation, whether by researching the core organisational goals or understanding government priorities...there are no exact future roles, however, to prepare for the future, they constantly have to adopt a greater role as investors and strategic partners as the demands of their organisations will further exceed their capacity to deliver in-house...Future roles are based on the combination of value of the organisation and design workforce..."

"Facilities managers today are expected to understand their companies' core business strategies and contribute to the bottom line, not only by reducing facility costs, but also by improving productivity, generating revenue and image of the organisation. Future facilities managers should be looking into the sustainability of the industry and how it is going to bring changes...."

These statements suggest that service should be at the core of any facilities management system and focus in future will be on optimising customer service quality and sustaining the profession, and this will require equipping facilities managers to prepare for future demands and capacities [22].

In the words of another respondent:

“...facilities management as an industry needs to think its approach and needs to stay competitive and there are still many efficiency gains to be achieved”.

This implies that in order to maintain competitive advantage, while benchmarking against best practices, which is important in facilities management, organisations need to constantly review their approaches in practice.

It was also found that the 4IR could help in incorporating sustainability considerations in facilities management practice. According to respondents:

“Future facilities managers should be looking into sustainability...and how it is going to bring changes....global warming ...and with the need to change to more sustainable options, facilities managers and service industry can expect the 4IR trend to affect the supply chains as well as building design, management and maintenance...systematic design will become more and more important because of technological advances...”

“Facilities managers will be challenged to control and co-ordinate new environments...and more innovations....”

There is the use of the IoT and virtual intelligence, and drones, which are innovative tools that can allow easier and more reliable information gathering and recording [21], [23].

Further findings revealed that the future of the facilities manager would entail being proactive in undertaking their functions, as stated by one of the respondents:

“The facilities management of the future will be proactive and empowering rather than reactive and constricting”

This emphasizes the need to equip the future facilities manager with the necessary skills to be able to face the challenges of the 4IR. Managing the change will require a new model of education, complete with targeted programs for teaching facilities managers' new skills [7]. The real opportunity is to look beyond technology and find ways to give the greatest number of people the ability to impact their families, organisation and communities [6]. Organisations need to ensure that they invest in the enabling technological infrastructure and skills to make sure that they are not left behind [18]. Therefore, awareness and skills should be impacted in higher institutions and training of staff members to acquire skills beyond basic digital literacy. The implications for the facilities managers and the real estate sector as a whole, are that digital technologies will require soft skills and applied creativity in performing functions involving customer interaction, and service delivery enhancement [21].

5. Conclusion

The study set out to investigate the perceptions of facilities management practitioners on the impact of the 4IR on facilities management practice. The future sustainability of the facilities management profession is a concern given the unabating impact of technological advancement. The findings revealed that the main concern was on the continued delivery of services to the clients' satisfaction, as well as the upskilling of employees to be able to harness new technologies.

The findings of this study are envisaged to encourage the training and upskilling of facilities management practitioners to be able to integrate and adapt new technologies and tools in current processes and functions. This will ensure that they are not left behind in this era of the 4IR. Opportunities to train and upskill facilities managers should be embraced. Facilities managers should continue to partake in delivering sustainable development goals in the era of the 4IR.

The current study's small sample limits the generalization of the results. However, findings give useful insight on how facilities management practitioners perceive the impact of 4IR on their profession. Further studies are on-going, which includes other practitioners in the built environment industry, in order to obtain more generalisable findings.

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