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An Investigation of the Influence of Public Clients on Contractors' Behaviour towards the Modern Methods of Construction

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Recently, the Modern Methods of Construction (MMC) are gaining ground due to the support of both the private and governmental sectors. However, the scale of the uptake among more traditional contractors is still weak. On the other hand, public clients have a track record in motivating the traditional sector to adopt innovation towards meeting their specific needs. This paper aims to investigate the gaps within the public sector and their ability to accelerate innovation. The study will review existing literature relevant to understand the required relation and influence. The central hypothesis of this research is that public client's engagement in procuring MMC projects would trigger and accelerate traditional contractors' organizational transformation to adopt such methods. Hence, this study aims to understand the complex dynamics of the involvement of public clients on possibly motivating traditional contractors towards offering innovative solutions. The findings of this research would support the effective intervention for more effective diffusion of MMC and add to the knowledge of facilitating a greater adoption of innovation within the UK public bodies. The main objectives of this research are to a) Understand the relation between public clients and contractors, b) Examine the influence exerted by public clients on contractors' behaviour, and c) Investigate the ability of public procurement frameworks to act as integrators towards increasing the adoption of innovation. The findings highlight a gap within existing literature represented by the limited studies addressing contractors' behaviour in the public client context, particularly in MMC, and more understanding of public clients' decision making processes are needed to enable researchers and practitioners to have better understanding on contractors' behaviour towards the adoption of innovation's body of research.

Keywords: Modern Methods of Construction; Accelerating Innovation; Public Clients; Adoption of Innovation; Public Procurement Frameworks

Introduction

The construction industry is under extreme pressure to meet market needs whilst ensuring vast developments through embracing technological advancements, abiding by sustainability guidelines, and significantly reducing associated risks. Such a pressure has created a new direction within the industry, towards methods that would enable the industry to address such challenges. The Modern Methods of Construction (MMC) are methods that transform major construction activities from being executed in an uncontrolled, risky, and costly environment, to a more certain one. However, despite their proven benefits, such methods are yet far from reaching their full acknowledgement from the industry, where most activities remain largely leaning towards traditional ways of delivering construction projects (KPMG, 2016).

Public clients have a potential to exert an influence on the construction sector to adopt innovation. Such a characteristic, in the context of MMC, might be beneficial in driving the industry for a fundamental transformation. To achieve a better understanding of such key stakeholders, their importance, behaviour, influence, and decision-making processes are to be investigated in line with the adoption of innovation studies. This study aims to highlight the gaps within existing research literature to enable research to focus on the pressure points that can enhance the adoption of MMC. This study adopts a systematic literature review that critically examines collected studies to further understand the dynamics of public clients' decisions and their ability to embrace change. The relationship between public clients and the contractors and the influence exerted by the client on its supply chain's behaviour are to be critically analysed.

Public Clients can be defined as organizations that use government and social funds to ensure non-profit approaches within their procurement for better value (Hartmann et al., 2015). Those clients play vital roles in the construction industry, shaping construction processes and future directions. In terms of change, public clients are vital in triggering change and innovation as one of their characteristics. However, public clients must initially accept change prior to imposing an effective influence on other stakeholders to take similar steps (Manley, 2006). Such acceptance is of importance due to their negative potential in acting as innovation inhibitors as acknowledged by (Ivory, 2005). The same study reports the need is not to require

public clients to merely focus on time, cost, and risks only; but also create an avenue for innovation as an equal addition to the standard concerns.

As an emerging innovation, the Modern Methods of Construction (MMC) are currently being featured by the UK government due to their potential in addressing the key industry needs in terms of sufficient supply, certainty increase, and sustainability perspectives. As an innovation, MMC is taking interest in the construction industry's public body, alerting for a potential positive transformation. Yet, the intake of MMC among the key stakeholders is still unsatisfactory, with only £1.5 billion being as an input to all practices categorized as "not routinely" done in the UK industry (UKCES, 2013). In the context of client's influence, Winch (1998) suggests that clients can pressure the industry to accept, generate, and implement innovation, but only if the clients were keen to accept such approaches. Aligning this with the public body, the government recently published "The Construction Playbook", which emphasized the need to strictly abide by 14 policies as an approach to ensure that emerging and innovative practices are being considered within public procurement practices (Cabinet Office, 2020). The document emphasized the use of MMC among public clients and identified the roadmap for clients to accept such approaches in their construction options.

Coherently, Nam & Tatum (2010) argued that it is not the clients' motivation and willingness that can embrace acceptance and change, but the awareness and technical knowledge and experience are key for the effective thrive of innovation. Similarly, Koch & Hauknes (2002) discussed that procurement of innovation cannot be formulated in isolation and there is a need for an "interaction" among the key stakeholders through proper behaviour that can drive the industrial dynamics towards meeting the desired goals. This implies that both parties, representing supply as contractors, and demand as public clients, have a vital role in achieving the required transformation. Previously, research indicated that public clients were usually ignored alongside their role in potentially driving innovation and change across the region (Lindblad & Gustavsson, 2021). Hence, there is a need to understand the relation between the public client and the contractor and how is the latter is being influenced to adopt innovation by the former.

Methodology

This study focuses on reviewing existing literature towards identifying potential gaps within previously published works; Subsequently, enabling a better understanding of the unanswered questions that future studies can cover and address. Towards both defining and refining those questions, reviewing literature is the initial vital step in any research process (Carnwell & Daly, 2001). This study adopts a narrative literature review, relating existing studies to emerging innovations, an approach that acts as a credible method in consolidating research works relevant to a specific topic (Chow et al., 2005). Due to the limited research on public clients and their abilities to enable innovation, this study identified 10 articles, distributed as seven from journal papers and three from international conference proceedings. The journals were stated as publishing scholarly studies and are listed in the top construction management journal rankings by Wing (1997) such as Construction Management and Economics (CME) and Journal of Management in Engineering (JME). Moreover, frequently cited studies are included as well in this research, represented by Structure and Infrastructure Engineering, Facilities, and Engineering Sustainability Journals. Studies collected are represented in the below table.

Table 1: Studies and Resources

Resource	Title	Journal/Conference
(Lingard et al., 2019)	The client's role in promoting work health and safety in construction projects: balancing contracts and relationships to effect change	Construction Management and Economics
(Gurevich & Sacks, 2020)	Longitudinal Study of BIM Adoption by Public Construction Clients	Journal of Management in Engineering
(Lindblad & Guerrero, 2020)	Client's role in promoting BIM implementation and innovation in construction	Construction Management and Economics
(Lingard et al., 2019)	Embedding occupational health and safety in the procurement and management of infrastructure projects: institutional logics at play in the context of new public management	Construction Management and Economics
(Kadefors et al., 2019)	Public procurement for carbon reduction in infrastructure projects – an international overview	Sustainable Built Environment Conference 2019 (Sbe19 Graz) Conf. Series: Earth and Environmental Science

(Rosander & Kadefors, 2019)	From project to policy: Implementing a collaborative procurement strategy in a public client organization	Proceedings of the 35th Annual ARCOM Conference, 2-4 September 2019, Leeds, UK, Association of Researchers in Construction Management
(Lam & Gale, 2014)	Framework procurement for highways maintenance in the UK: can it offer value for money for public-sector clients?	Structure and Infrastructure Engineering
(Alharthi et al., 2015)	The changing role of the public client in construction procurement	Proceedings 30th Annual ARCOM Conference, 1-3 September 2014, Portsmouth, UK, Association of Researchers in Construction Management
(Love et al., 2012)	Procurement of public sector facilities	Facilities
(Sourani & Sohail, 2019)	Barriers to addressing sustainable construction in public procurement strategies	Engineering Sustainability

Discussion

Importance of Public Clients

Public clients are referred to as key stakeholders who can influence the whole industry. As decision makers, public clients acquired their reputation to influence construction supply chains (Gurevich & Sacks, 2020). Having such an influence, public client organizations tend to be directly responsible to promoting innovation across the industry (Lindblad & Guerrero, 2020). This is achieved by supporting the innovative environment through the power that public clients can exert to achieve more efficient processes. Moreover, Lingard et al. (2019) report a case where public clients have driven an innovation that was effective to the overall sector, this can be justified by the scale of such clients in the overall industry's turnover, representing around 40% (Sourani & Sohail, 2019). Such a staggering percentage is distributed in vast construction activities that includes education, social services, libraries, and transportation (Lam & Gale, 2014). However, Sourani & Sohail (2019) reports that different barriers exist and can influence public client's decisions to include innovative practices in their procurement strategies.

Public Client Behaviour

Public client's behaviour is a vital aspect to be investigated to highlight the dynamics of their procurement activities. It is reported that a gap in research exists with respect to the clients' role and behaviour which in return is halting more coherence of their capabilities (Alharthi et al., 2015). Lingard et al. (2019) report that clients' activities are influenced by their beliefs, values, and assumptions that in return can impact embracing change or accepting innovation. Moreover, another key factor influencing clients' decision and behaviour are the emerging policies that regulates the public body's strategies (Rosander & Kadefors, 2019). However, these policies and governmental trends are not always effectively influencing public clients as required. Coherently, Sourani & Sohail (2019) indicated that UK public clients have been reluctant to align with many governmental publications, which aimed to facilitate innovation, due to the existence of several inhibitors. Such functions influencing clients' decisions can be linked as "excuses" for clients not accepting innovation practices. On the other hand, Lindblad & Guerrero (2020) suggest that clients can adopt "innovation policies" that exploit the competitiveness of the industry and result in client's behaviour to influence contractors. The same was reported by (Lingard et al. (2019), as the increase of competitiveness triggered by the client's demand increases the price competition that in return enhances the procurement decisions. In the UK case, Kadefors et al. (2019) reports that the leadership characteristics in clients can strongly influence behaviours in the contracting business.

Contractor-Client Relationship

Understanding the relationship between both the supply and demand can result in further understanding on the avenues to integrate innovation. Gurevich & Sacks (2020) highlight that ensuring a long-term relationship, that public clients can govern, was proven to produce values that are manifested in the key project activities, enabling successful outcomes towards project completion. Similarly, collaboration was described as a vital aspect strengthening the relationship and ensuring more efficiency and less uncertainty (Rosander & Kadefors, 2019). Arguably, Lingard et al. (2019) discussed that this relationship is easily hindered and client interventions, if not being carefully managed, can lead to impacts on the contractor-client relationship. Similarly, Lingard et al. (2019) reports that clients must not be involved in activities that might result in damages on the vital relationship with the contractor, and rather must focus

on the activities that improve innovative practices. As the relationship is very fragile, Lingard et al. (2019) also discussed that the development of “mistrust” from the supply side can have negative effects on the overall collaboration desired.

Clients Influencing Contractors

The influence of clients on contractors as reported by existing literature can enhance the understanding of the requirements needed to enhance innovation. Traditionally, clients adopted “control mechanisms” in an attempt to ensure that contractors are adhering to proper performance measures throughout their projects (Lingard et al., 2019). This control was merely implemented as one of the clients’ main objectives. Lindblad & Guerrero (2020) reports that clients can promote interaction in their projects, triggering competition between the contractors to drive innovation and succeed in creating a competitive environment. This in return was indicated to be an effective strategy that influenced contractors to embrace change. Similarly, Sourani & Sohail (2019) reports that this change cannot be embraced within the traditional sector due to their “passive culture”, unless this was firmly initiated by the client. Such an influence is extended to the use of public procurement frameworks, where promising relations for long-term collaboration, is influencing contractors to improve as an approach to stay within the loop of future works and business opportunities (Lam & Gale, 2014).

Knowledge and Awareness

Knowledge and awareness of were emerging themes within existing literature being referred to as vital prerequisites. Acquiring sufficient knowledge is key for any organization and is accompanied by deeper value and better future judgements (Gurevich & Sacks, 2020). Kadefors et al. (2019) reports that such knowledge plays a vital role in sustaining “long-term innovation processes” that is merely done through exchanging such knowledge between projects. On the other hand, not acquiring knowledge can act as a significant inhibitor in the decision-making process where client lack sufficient means to make an effective decision (Rosander & Kadefors, 2019). Coherently, Alharthi et al. (2015) indicates that there is evidence of the sector’s behaviour in not learning from previous projects, where this is halting the improvement within procurement strategies, and suggests that “regular review” is required to continuously develop and acquire knowledge. In the public sector, innovations must

be considered early and in the design stages to ensure an effective outcome (Love et al., 2012). Where Sourani & Sohail (2019) report that the lack of awareness within the public body on specific innovations will either result in ignoring those or implementing the minimum adoption just to comply with existing regulations. The same study suggests that education institutions must partner with public clients to further ensure that the knowledge and awareness exist among the decision makers.

Adoption of Innovation

To adopt innovation is a critical aspect that require more research on the dynamics of how such an adoption is being met within public bodies. Gurevich & Sacks (2020) indicates that to reach an effective adoption, levels of coordination and motivation are expected through public agencies to formulate suitable strategies capable to create the right conditions. Due to the construction industry's bad reputation of minimum productivity, lagging other industries, public policies could enable the adoption of innovation to address such a lag (Lindblad & Guerrero, 2020). The same study reports that innovation is a "linear process" being offered by providers and attracted by clients to meet ongoing needs, and this can be perceived as the dynamics on which the market must understand in order to achieve more adoption of innovation within the public construction sector. On the other hand, contractors can play a vital role as well, if permitted, to increase such integral adoption. Love et al. (2012) reports that the inputs of contractors in the design phase is a vital action that stimulates innovation. However, Sourani & Sohail (2019) reports that due to the public sector's nature, public clients can easily ignore adopting innovation if the time factor wasn't for their advantage; for instance, meeting a limited funding opportunity.

Procurement Frameworks as Integrators

Public procurement frameworks can play an integral role in facilitating the adoption of innovation. Lindblad & Guerrero (2020) defined the integrating role as the action that brings two innovation actors together through specific practices. Being developed in the UK and in line with the European Parliament for coordination, such agreements aims to ensure long-term relationships between public clients and contractors (Lam & Gale, 2014). However, it is reported that despite the effectiveness of such frameworks, those are not yet currently being accepted by all the key construction stakeholders. In terms of innovation, change towards innovation is discussed to be complex between

the supply and demand sides in the public sector (Kadefors et al., 2019). This required frameworks that can drive such change and embrace acceptance between both sides. The government is aiming to enhance construction through such frameworks (Lam & Gale, 2014), where those can be described as the integrators with the potential to increase the adoption of innovation.

Theoretical Framework

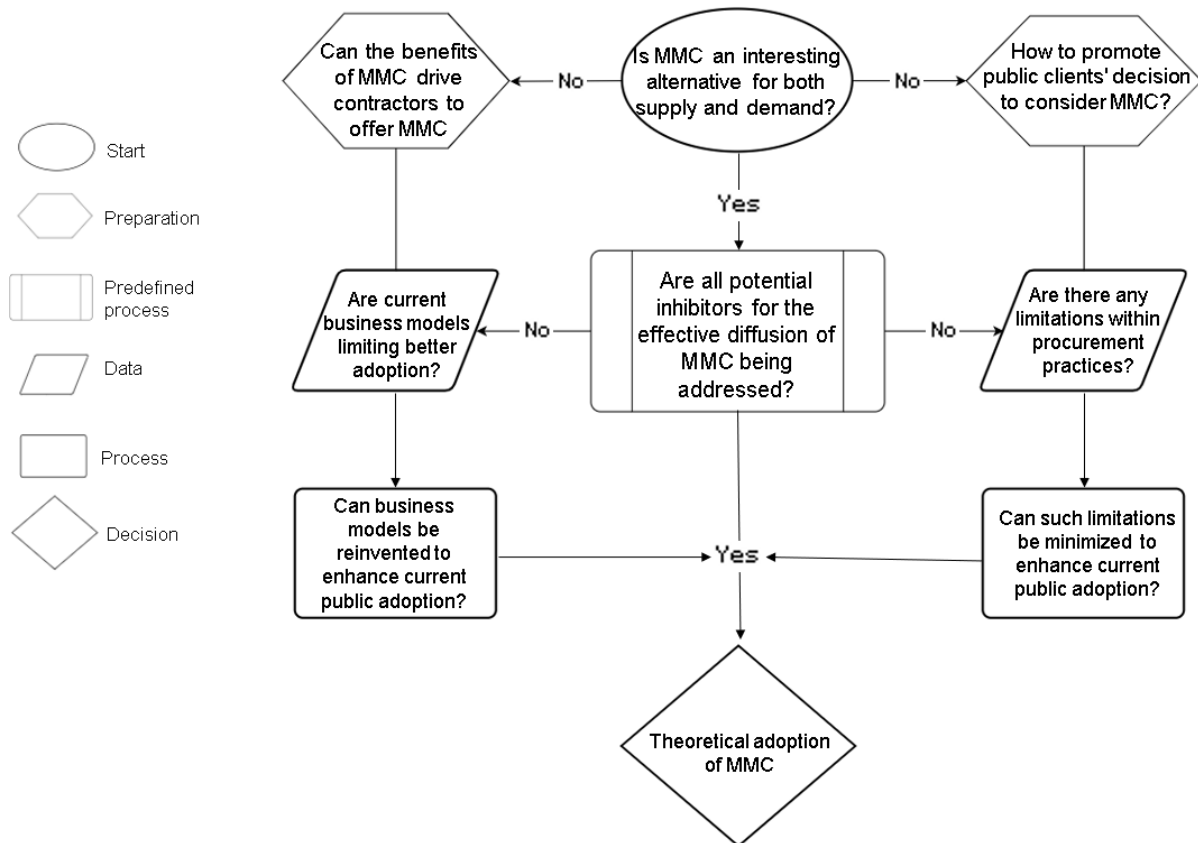


Figure 1: Theoretical framework of the Trading Dynamics Influencing Adoption of Innovation

Conclusion and Future Research

In the context of innovation, many aspects are to be considered to increase the uptake of MMC by the public bodies. To achieve this, a better understanding of the public client’s behaviour is foreseen as different from normal clients due to exceptional influences on the standard decision-making process within their construction procurement. Such behaviour is influencing contractors towards bespoke practices alongside impacting the relationships with the supply side. Moreover, knowledge and awareness were an emerging function that can also act as a vital contributor towards the effectiveness of public clients’ decisions. All those dynamics identified might be

further enhanced with more understanding of the capabilities of public procurement frameworks, where those can act as integrators of innovation within the public clients' procurement strategies. This review identified that the context of where MMC is being investigated in the public sector is limited, creating a vital research gap, that is in return neglecting the important role that public clients can play to deploy innovation and embrace change represented by accepting MMC as effective alternative for conventional practices. Future research will focus on answering the following questions.

- Can public client behaviour influence contractors to embrace change and adopt innovation?
- Can reinventing existing business models enhance and promote innovation?
- Is there any activities within current public procurement practices unintentionally limiting innovation?
- How can the relation between public clients and contractors be enhanced to achieve better collaboration?
- Can public procurement frameworks govern the relationship of public clients and contractors to achieve effective trading dynamics?

This study aims, through a literature review, to understand the gaps within the public sector potentially limiting the adoption of innovation. Research on the impact of public procurement frameworks on the outcomes is limited (Lam & Gale, 2014). And such a gap in research is impacting the correlation between public clients and the supply chain, alongside uncertainty around the role that procurement frameworks can play to facilitate the adoption of innovation (Alharthi et al., 2015).

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