2024 European Conference on Computing in Construction
Chania, Crete, Greece
July 15-17, 2024

UNVEILING PROSPECTS THROUGH PLATFORM-DRIVEN TRANSFORMATIONS IN MODULAR CONSTRUCTION SUPPLY CHAINS

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Abstract

Managing intricate supply chains (SCs) in modular construction is challenging, necessitating a nuanced approach to enhance effectiveness. This study aims to explore the potential of platform thinking—a methodology that reimagines traditional, linear SCs into dynamic, interconnected networks, aligning producers' resources with user needs, through an integrative literature review method grounded in supply chain management (SCM) theoretical perspective. Identifying four prospects for platform-induced SC reconfigurations, this study offers novel perspectives on preparing the modular sector for the platform revolution, highlighting the importance of understanding its benefits and challenges.

Introduction

Change is unavoidable, regardless of how well established a business or profession is. A new type of supply chain (SC) business model has been adopted by a wide range of businesses over the last two decades. Without gratifying much about the importance of those, it would be easy to start by thinking of companies like Apple, Uber, Airbnb, and Twitter. This new generation of companies has taken a different approach to reaching scale while meeting a wide range of client demands. For centuries, businesses operated on a pipeline SC design; they would manufacture a product and push it towards a consumer in which value had been produced upstream and consumed downstream, creating a linear value model like a pipe. Choudary (2015), on the other hand, noted that the growing connectedness of entities (as part of the globalisation), decentralised manufacturing, and the embedding of artificial intelligence have driven traditional sectors to adopt an entire new SC model.

Accordingly, many firms in a wide variety of industries are acting as a platform to facilitate producers and consumers of value around the world to connect and interact with each other in a manner that was not possible in pipe design. Traditional taxi businesses, for instance, were historically established with ownership/possession of hundreds of cabs, and passengers were needed to request the cab directly from the firm or the driver without even knowing what the rate would be. Companies such as Uber, on the other hand, are now functioning as a platform to link convertible roles (no specified roles for participants; a driver in one instance might become a passenger in the next) of drivers and passengers toward an economic transaction without even owning a single taxi for the firm itself. As a result, such platform-based firms enable externally positioned producers and consumers to trade value within the SC while also allowing them to be a part of their core business function. This shattered the long-established feature of the firm being the producer of value while enabling multi-dimensional value exchanges among many SC stakeholders, which is the primary deviation from the pipeline model.

The success achieved by various industries due to the transition from pipe to platform-enabled SC models is undeniable. By the end of 1980s, there were less than ten firms who has tried at adopting platform strategy into their SC functions. However, the Forbes Insights survey (2017) found out that 31% of organisations consider themselves top performers in platform thinking, enabling both external and internal SC stakeholders to interact with the organisation and widening the availability of the organisation's digital resources to all stakeholders (McKendrick, 2017). In 2019, it was reported that seven of the world's ten most valuable firms are based on platform-enabled models with less than two decades of existence. As a result, the advantages and potential disruption to established firms from platforms seem essentially inconceivable. Parker *et al.* (2016) rephrased Marc Anderssen's famous slogan "software is eating the world" in 2011 to highlight the massive disruption caused by software-based digitalisation in every aspect of human life as "platforms are eating the world" because software alone is insufficient with current market features: increasing interconnectivity, decentralised manufacturing, and the emergence of artificial intelligence.

As a result, the potential value that can be realised by a platform opportunity in the modular industry is unmistakable. Even though the modular industry already comprises the market attributes, platform disruption has only been examined as a feasible tool for achieving mass customisation (Bertram *et al.*, 2019). However, an investigation into current platform studies in modular construction revealed that the identification of further opportunities arising from unique SC reconfigurations induced by platform applications in modular construction has received minimal attention. Also, as Thurairajah et al. (2023) reveals, even though most production procedures in manufacturing sectors are mature and ready to use, applying these approaches blindfolded without systematically thinking about or adopting them may bring additional issues in any given context. As a result, the purpose of this study is to take the initiative in presenting on how the platform thinking may provide effective SCM within the modular construction. Thereby, this study intends to demonstrate the viability of platform-enabled SC in a modular construction setting in a methodical manner.

What is platform thinking?

Thomas, Autio, and Gann (2014) establish platforms as control and monitoring mechanisms within SCs, concentrated on shared technology, standards, and assets that confer benefits to contributors. Robertson and Ulrich (1998) present a more inclusive definition of platforms as a collection of assets—encompassing components, processes, knowledge, people, and relationships—shared among a range of product SCs. In essence, platforms constitute a unification of components and rules governing SC relationships, where components encompass software, hardware, service modules, and architectural frameworks delineating their interactions (Henderson and Clark, 1990), and rules encompass standards, protocols, and regulations organising the activities of contributors within the ecosystem (Baldwin and Clark, 2000).

The application of platform thinking to restructure a firm's SC into somewhat standardised is not a recent phenomenon. In manufacturing, it is routine to leverage past designs to improve or fix shortfalls in prior activities, resulting in the emergence of platforms as subsystems and interfaces facilitating efficient development and production of product families, such as automobiles or consumer electronics devices (Muffatto and Roveda, 2002). A fundamental objective of such platform-based new product development is to augment product variety, addressing diverse customer requirements, business needs, and technological advancements, while upholding economies of scale and scope within manufacturing processes—a concept inherently linked with "mass customisation" (Pine and Davis, 1993).

Platform thinking in construction

The advent of platform thinking in the construction sector, especially through the strategic use of artificial intelligence, digital innovation, and the standardisation of processes, marks a pivotal transition towards a more synergistic, efficient, and forward-thinking modus operandi. Studies, such as of Oprach et al. (2019), elucidate the way a platform-centric approach, augmented by AI, substantially boosts data interoperability and utilisation across diverse organisational frameworks, thus engendering an ecosystem ripe for innovation and streamlined operations within the industry. Concurrently, Jansson, Johnsson, and Engström (2014), alongside Eriksson and Emilsson (2019), lay emphasis on the quintessential role of standardisation and modular design, coupled with the implementation of process platforms, as instrumental in enhancing product delivery flexibility and efficiency. Such platforms adeptly manage consumer specifications, bolstering competitive product propositions while steadfastly adhering to a platform-centric strategy. Furthermore, Lapidus (2022) broadens this discourse to encapsulate large-scale construction ventures, where organisational and technological platforms, through the leverage of digital technologies and information modelling, optimise construction undertakings. Additionally, the discourse on platforms as pivotal in knowledge management within construction firms, as posited by Styhre and Gluch (2010), illuminates their utility as boundary objects that amalgamate functions and codify procedures—a cornerstone in the efficacious management of knowledge and the propulsion of innovation.

Yet, despite the apparent advantages and the progressive integration of platform thinking within construction paradigms, a discernible lacuna persists in its application to SCM within the domain of modular construction. Characterised by its predilection for prefabrication and assembly-line proficiency, modular construction is ostensibly positioned to reap substantial benefits from platform-centric SCM methodologies. Such an amalgamation promises not only to streamline operational processes but also to foster stakeholder collaboration, thereby paving the way for more sustainable and cost-efficient construction modalities. Yet, the existing literature lacks comprehensive analysis on the effective implementation of platform thinking in SCM for modular construction. This identified gap serves as a critical research avenue for this study, aiming to explore the transformative impact of platform thinking on SCM practices, thereby ushering in a new epoch for modular construction and the construction industry at large.

Research Method

Using an integrative review methodology, this study seeks to investigate the effect of platform thinking on the effectiveness of SCM within the milieu of modular construction. The motive for using an integrative methodology was established on its ability to foster a comprehensive discourse around ongoing challenges by combining and processing existing theories or concepts (Synder, 2019). Integrative literature reviews, whether they focus on well-entrenched or emerging subjects, vary predominantly in their synthesis approach. For recognised topics, this method involves a thorough examination of existing scholarly contributions, facilitating a critical assessment to either recontextualise or expand prevailing theories. On the other hand, for emergent fields, it envisages producing innovative theoretical frameworks or models (Synder, 2019). Following this principle, this study looked for literature, employing terms such as "modular construction," "supply chain management," "platform business models," and "platform thinking," located from authoritative databases like Google Scholar, Scopus, and Web of Science. This search yielded insights into the evolution of the platform concept across various industries and the enhancements it has spurred. This phase was succeeded by an investigation into the potential of platforms to revolutionise SCs across sectors. This led to an analysis focused on the modifications within modular SCs that accompany a successful reconfiguration from product-centric to platform-centric models.

Background

Supply chain management (SCM)

The definition of "supply chain" exhibits a greater consensus compared to the definition of "supply chain management" (SCM). While La Londe and Masters (1994) offer a straightforward perspective, viewing a SC as a "set of firms that pass materials and services forward," Mentzer *et al.* (2001) present a nuanced view, outlining it as a "set of three or more functional bodies directly involved in the upstream and downstream flows of products, services, finances, and/or information from a source to a customer" (p.4). The management of these SCs serves as a mechanism for SC components, aiming to foster an innovative mindset that creates significant value for end customers, as highlighted by Ellram (1990). In line with the reviewed literature, this study takes a stance on SCM by considering the SC as a unified entity to govern the flow of inventory from inception to destination. Additionally, it emphasises placing the sub-units of the entire SC logically for enhanced integration among inter-firm functions and strategic capabilities.

Love *et al.* (2004) articulate the intricacies of supply chain management (SCM) within the construction sector, outlining it as a network involving facilities and activities contributing customer and economic value to various functions, including design development, contract management, service, material procurement, materials manufacture and delivery, and facilities management. However, the reality of SCM in the construction industry reveals a lack of cohesion, adversarial relationships, and a project-centric mindset, hindering the optimisation of value creation (Bankvall et al., 2010). In scrutinising the underlying causes for these challenges, a paramount consideration is delving into the unique attributes of the construction industry and its project environments, which are often perceived as trailing behind other sectors in terms of clear and long-term supply relationships (Thurairajah *et al.*, 2023). Notably, Vrijhoef and Koskela (2000) highlight distinctive features in construction SCM, including converging SCs directing all materials to the construction site, project-specific configurations, and make-to-order SC relationships characterised by limited recurrence. This perspective aligns with Fearne and Fowler (2006), who argue that prevailing structural features in construction SCs are suboptimal from a production standpoint, primarily due to the inherent fragmentation and transience in supply relationships.

Modular construction and its Supply Chain (SC)

Concerning modular construction, Langlois (2002, p. 19) explains modularity as "a highly general set of principles for managing complexity. By disassembling a complex system into discrete pieces—capable of communication solely through standardised interfaces within a standardised architecture—one can obviate what would otherwise be an unwieldy entanglement of systematic interconnections." Within the construction industry, modularity manifests as the production of volumetric systems, along with sizable, prefabricated sections within a supervised manufacturing setting. Volumetric systems comprise three-dimensional modules functioning either independently or multiplicatively, contributing to the building's structural integrity (Thurairajah *et al.*, 2023). These modules, produced in a factory with all finishes (i.e., fixtures and fittings), involve least on-site installation work. Essentially, the modular construction approach entails off-site SCM, diverging from traditional on-site methodologies.

Prior to delving into the SC intricacies of modular construction, a prerequisite lies in delineating the disparities between traditional construction processes and the modular method, considering these as fundamental determinants of its distinctive nature. Notably, the design of modular buildings undergoes detailed scrutiny under the Design for Manufacture, Logistics, and Assembly (DfMA) approach, with a focus on real-world execution encompassing manufacturing, logistics, and assembly (Building and Construction Authority, 2017). Another distinction surfaces in the imperative for factory production, necessitating an early freeze on the detailed design to facilitate module production—a necessity absents in traditional construction (Thurairajah *et al.*, 2023).

Regarding the SC dynamics of modular construction, in contrast to the conventional SC, modular SC can be perceived as an intricate ecosystem encompassing firms, participants, information, and resources engaged in interconnected downstream and upstream processes and activities, culminating in value delivery within modular projects. This delineation encapsulates the fluidity of information and material flow throughout the delivery chain, spanning conceptualisation, tendering, design, procurement, construction, handover, and the operation phase of construction projects (Vrijhoef and Koskela, 2000). Given the apparent distinctions between traditional construction and the modular approach, the configuration of the supply and delivery chain in the latter departs from the former. The modular SC stages are typically concretised as design, procurement, production, logistics (encompassing transportation, buffer, and storage), and on-site installation (Luo *et al*., 2020).

Discovering Prospects in Platform-induced SC Reconfigurations

Most of today's platforms (i.e., iOS, Facebook, Google, etc.) started as successful standalone products, while some began as services or one-sided platforms. The Internet, which enables SC actors from anywhere on the globe to communicate in a matter of seconds, is primarily responsible for the transformation of products into platforms (Abdelkafi et al., 2019). On the other hand, Tiwana (2014) stated that such a transformation would be the safest alternative for product owners to establish a successful platform. Because successful products have an established consumer base, from which product owners are motivated to consider a future option to construct a

platform aimed at offering a more inclusive service to consumers as a collaborative effort of multiple parties. In the current world, anytime a product is successful and one side (i.e., consumers) accepts it in droves, each of these products is driven to add a second side to grow into a platform (iPhone added App Store, Facebook added advertising, Firefox added extensions). However, as Hagiu and Altman (2017) pointed out, such a transformation for successful products is not an instantaneous process, and organisations that are not born platforms are frequently left in the dark in search of a strategy to achieve this transformation.

In the domain of modular construction, Thurairajah et al. (2023) highlights a significant evolution in SCs, extending beyond the simple delivery of modular buildings to include elements that add value, such as servitisation—focusing on operational and maintenance aspects—and customisation, which empowers consumers to influence the specifications of modular products. However, the sustainability of these evolved SCs has been questioned. Persson and Lantz (2022) argued that despite the direct advantages derived from servitisation and customisation, these practices may not ensure the long-term sustainability of modular construction firms. The financial difficulties confronted by prominent modular construction companies in the UK, such as ILKE Homes and L&G, credited to the complexities of managing diverse service offerings, increased SC complexities, and the need for dynamic adaptation strategies, reinforce these concerns, causing unease among industry professionals regarding future SCM innovations.

Addressing these challenges, this study introduces four strategic opportunities, or "prospects," for modular construction companies to adapt to and leverage in the wake of SC transformations brought about by platforms. These prospects are identified through an adaptation of Tiwana's (2014) "four lenses framework," originally developed for software development, now repurposed for the construction sector. This framework uses four distinct perspectives to dissect and comprehend the extensive production processes in the context of platform thinking. The identified "prospects" offer modular construction firms a guide for strategic adaptation and enhancement in areas such as consumer interaction, operational efficiency, service diversification, and ecosystem collaboration, as depicted in Figure 01.

Prospect 1: Horizontal supply chain collaborations.

Barrat (2004) outlines horizontal SC collaboration as the collaborative inter-firm dynamics existing among entities operating at similar SC tiers (i.e., this could be component manufacturers considering the modular context). Barrat (2004) also suggests that these collaborations hold the potential for enhanced advantages, encompassing shared risks, mutual acknowledgment, and interdependence directed at shared or industry-wide goals which could not have been achieved by a single industry player.

Accordingly, a platform requires to have at least two sides (Eisenmann *et al.*, 2006), resulting the significant SC reconfiguration within any production process. Schmalensee and Evans (2007, P.38) emphasised that the unifying factor of all platforms is that they facilitate interactions between at least two or more "distinct" groups who want to engage with and require each other but cannot initiate such interaction by the current means of. As a result, Tiwana (2014) determined that to be a true platform, two distinct parties must be offered, with the platform actively engaged as the medium for the interaction (i.e., based on that claim, ERP is a one-sided platform in which the platform owner-software developer serves the needs of the enterprise/company without interfering with or governing communications between the company and its third-party suppliers/professionals). As a result, in any product environment, if there is any chance that two or more parties might enhance their values by having someone support them in finding each other and engaging cost-effectively, then there is an opportunity for a platform to be established. By saying so, it does not imply that the interaction would be impossible to occur in the absence of a platform; rather, the existence of a platform has made such interaction simpler and less expensive by linking in ways that those parties could not directly connect (Evans, Hagiu and Schmalensee, 2006). Platforms could serve as a conduit for facilitating value-infused interactions between two or more parties.

Prospect 2: Demand-responsive supply chains.

The imperative of SC Responsiveness (SCR) has escalated, presenting paths for competition in business landscape. Formerly a conceptual abstraction, SCR has become into a strategic tool, necessitating the evolution of SCs towards heightened flexibility and responsiveness (James-Moore,1996). Accordingly, SCR is seen as the capacity of the SC to adeptly address variations (i.e., niches) in general consumer demand (Holweg, 2005). It also captures the coordination of production, inventory, location, and transportation within the business firms of SC, strategically optimising responsiveness and efficiency tailored to the relevant market dynamics.

In light of this, consumers (markets) for any product SC can be identified under two categories: core and niche markets. However, satisfying the needs of the niche group of consumers (also known as long-tails in the product market) is fairly challenging within the economics of scale in manufacturing (including modular construction) since such consumers' needs are somewhat distinct from the basic/ every-day consumers' demands (which majority of the product market) (Rogers, 2004). As a result, product owners might consider a platform solution to handle the market's long tail through smaller competitors in the industry. Such a choice by product owners to form a platform may be an alluring option to: digitise and modularise (decentralise) the production activities that are currently provided in-house; provide additional goods or services to enhance the value of the core product; bring specialised collaborators who are excelled at performing

a certain activity rather than manufacturers themselves; enable smaller firms to improve their work based on producers' work without replicating it (Gawer and Cusumano, 2008).

Prospect 3: Vertical supply chain collaborations.

In contrast to the previously examined horizontal collaboration, vertical SC collaboration delves into inter-firm relationships at various levels within the SC (Barrat, 2004). This entails exploring the dynamic between suppliers and manufacturers, specifically in a modular context this could be manifested as the collaboration between component manufacturers and mega manufacturers.

coordination among business entities, industries must methodically define problems, explore available options, and forge agreeable solutions by fostering collaboration across diverse functions within the industry (i.e., in the context of the modular industry, these functions span design, planning, procurement, manufacturing, logistics, and operation & maintenance).

When a platform facilitates value-added interactions among and between two or more distinct groups, cross-functional collaboration impact (i.e., in platform literature this has been termed as network effects) define the level of value impact that every new contributor (from one group) may offer to the rest of the existing platform contributors (Tiwana, 2014).

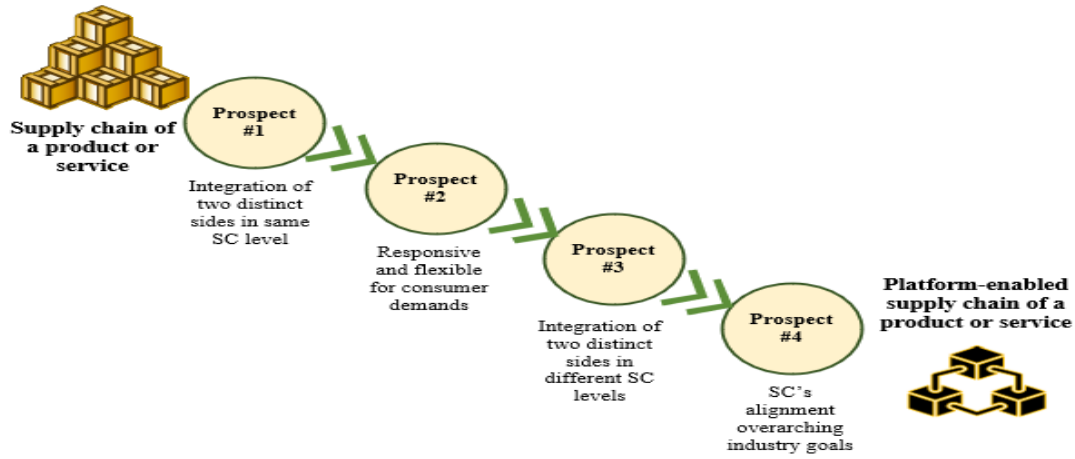

Figure 1: Four prospects due to platform-induced supply chain reconfigurations

Also, as discussed in the first prospect, a real platform should at least include two distinct parties. However, the initial inclusion of both parties by a platform owner proves unfeasible. Hence, Tiwana (2004) emphasised the importance of presenting at least one party from two distinct groupings to bring a platform to its true essence. Platform development, on the other hand, may face a "chicken-egg dilemma," in which interested parties may find a platform unappealing to join in the absence of a strong presence on the opposing side (Calliaud and Jullien, 2003). Consequently, Tiwana (2014) elucidates that if a prominent market player aligns with the platform solution, it induces other entities to join, driven by perceived prestige and the ensuing competitive advantage in their respective business domains. Once a party agrees to be corporative in the platform creation, the platform solution should include a compelling value proposition with the already recruited party to bring the other side onboard as well.

Prospect 4: Cross-functional collaboration impact.

Cross-functional collaboration within SCs facilitates a comprehensive evaluation of SC's state in alignment with industry needs. This evaluation serves as a foundation for crafting and perpetuating value through a collaborative assessment (Oliva & Watson, 2009). Beyond mere

This level of collaboration impact (network effect) might be perceived by contributors in the same group (same-side network effects) or by contributors in a different group (cross-side network effects). Tiwana (2014) emphasised the importance of a clearly established second side to produce cross-side effects rather than same-side effects because such effects would assist the platform in generating downstream sub-products (rather than just increasing the consumer base or supply rate by having more contributors on the same side) that the core market group could use to enhance their experience with the main product or service.

As a result, if any production process is transformed into a platform, the platform owner should be able to recognise that there is more than one "other side" that could inflict the most obvious cross-side network effects. Therefore, Tiwana (2014) asserted that every production or manufacturing scenario that can be observed via at least two of the impacts depicted in the four lenses (refer to Figure 01) that generate due the product's transformation into a platform.

Expected prospects due to platform-induced modular construction SC reconfigurations

Modularity in construction fundamentally transforms complex buildings into manageable, independently produced components that together constitute a unified structure. This approach, deeply embedded in the principles of mass production within controlled settings, has traditionally been recognised as a collective endeavour among various manufacturers (Langlois, 2002). Yet, recent challenges faced by modular factories, especially those related to scaling component production, necessitate a critical reassessment of these collaborative frameworks (Ethiraj & Levinthal, 2004). Such challenges not only question the efficacy of conventional collaboration in component manufacturing but also spotlight the limitations in applying modular principles in practice.

This situation highlights the necessity for a thorough reassessment of the manufacturing strategies within the modular SC, suggesting the need for a unified approach across various SC entities. However, we would like to highlight that the purpose such evaluation is not aiming to detract from the value of current alliances within the modular domain but rather to improve the collaborative efficacy of these partnerships (Brusoni & Prencipe, 2001). Within this context, the adoption of platform thinking is pivotal, promoting an integrated ecosystem of stakeholders in the modular construction SC. This approach enables direct access to a broader spectrum of component manufacturers, overcoming conventional geographic limitations (Parker, Van Alstyne, & Choudary, 2016). Such strategic unification not only streamlines procurement processes but also ensures the participation of the most appropriate contributors for each initiative.

Moreover, the modular construction industry's inherent adaptability, particularly through the use of prefabricated components, positions it uniquely to address diverse customer requirements (Baldwin & Woodard, 2009). However, the pursuit of extensive customisation within this model presents challenges, notably in reconciling the advantages of standardisation with the intricacies of individualisation. The pursuit of excessive customisation may dilute the efficiency and scalability that are hallmarks of modular construction, risking resource allocation away from broader market needs and impacting production timelines and efficiency (Thurairajah et al., 2023). Embedding modular offerings within platform-based frameworks offers a systematic method to maintain both the autonomy of individual component production and the integrity of the assembled product. This approach aligns with Tiwana's (2014) perspectives on innovation and is exemplified by Dell's successful mass customisation model, which assembles personalised products from a spectrum of supplier components (Berman, 2002).

Despite apprehensions that platforms might enable dominant entities to overshadow smaller firms, a more discerning view recognises the ambivalent nature of platforms. While platforms can introduce imbalances and governance complexities requiring vigilant regulation to ensure fair participation (Tiwana, 2014), they also present strategic benefits for all stakeholders. Platforms enable small and medium enterprises (SMEs) to engage with larger markets, gaining visibility and opportunities for growth by addressing niche demands. Apple Inc.'s platform strategy exemplifies how integration with a global network of developers can augment service offerings while supporting smaller contributors (Stratton, 2020).

Further, platforms centric SCs equipped with modern digital technologies and artificial intelligence substantially optimise design and production workflows, ensuring that supply dynamically matches demand. This enhancement not only streamlines production and inventory control but also equips the modular construction industry to swiftly adapt to changes in market dynamics and consumer preferences. Also, the analytics derived from interactions on these platforms provide invaluable insights into market trends and operational performance, enabling the refinement of products, reduction of waste, and improvement of customer satisfaction. This shift towards an analytics-driven, consumer-oriented approach signifies a notable advancement in the strategic market positioning of the modular construction sector (Kagermann, Helbig, Hellinger, & Wahlster, 2013).

Overall, the advent of platform thinking within the modular construction SC represents a significant departure from traditional methods, ushering in an era defined by enhanced integration, flexibility, and creative innovation. These platforms do more than just improve collaborative efforts and customisation capabilities; they transform the future of the industry, guiding it towards a path of increased agility, efficiency, and a stronger focus on customer needs.

Conclusion and Way Forward

The construction industry including modular, known for its historical resistance to change, finds itself on the brink of the impending platform revolution, an unstoppable force that has already reshaped various manufacturing and production industries. While acknowledging the industry's apprehensions and reluctance, it is also imperative for construction professionals to embrace this transformative wave. Accordingly, this study serves as a forewarning for construction professionals, encouraging them to embrace the imminent platform revolution. However, it is also crucial to dispel the notion that platform solution serves as a one-size-fits-all solution for the modular industry's challenges, a tendency often observed in past innovation breakthroughs. Instead, this study critically explores how platforms may reconfigure modular SCs, unveiling opportunities for effective horizontal and vertical integrations, demand responsiveness, and the ability to generate more value

impacts through cross-functional collaborations. The envisioned platform transformation in the modular SC is nuanced, neither a purely positive nor negative scenario. While it promises an efficient, collaborative, and responsive SC, it concurrently poses threats of consolidating power among major industry players. While the primary objective of implementing a platform solution is to facilitate an effective industry-wide collaborative SC, the existing competitive dynamics within the market structure pose a substantial impediment to realising the identified prospects. Consequently, advocating for a transparent and equitable platform governance model is imperative to pre-empt potential adversities and ensure the success of the initiative. This governance model is anticipated to prevent exploitation of medium and small-scale market players by larger entities, fostering a mutually beneficial, win-win scenario. Moreover, acknowledging the perceived hindrance posed by data sharing, particularly within a competitive environment involving market competitors, necessitates the establishment of predetermined governance mechanisms. These mechanisms are instrumental in delineating how data is shared, with whom, and to what extent, thereby fostering a consensus among platform participants while addressing concerns related to the exposure of intellectual properties within the industry. Therefore, it is essential for the modular sector to prepare for the platform revolution, not only by understanding its potential benefits but also by being cognisant of the challenges it may pose. Prepared with this knowledge, construction professionals can realise preventive mechanisms, drawing insights from other sectors that have already navigated the complexities of the platform revolution. The call to action envisioned in this study is clear: engage, adapt, and lead the way forward for modular industry in this platform-induced transformative era.

Acknowledgements

The authors would like to acknowledge the fundings received from the Research Development Fund at Northumbria University under the grant number: RDF20/EE/ABE/THURAIRAJAHNiraj.

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