

Business Model Innovation for Sustainability in the Construction Sector: An Institutional Theory Perspective

Suresh Renukappa¹, Arturo De Jesús Miranda Herrero¹, Subashini Suresh¹, Redouane Sarraikh², and
Thandava Gowda³

¹Faculty of Science and Engineering, University of Wolverhampton, U.K

²Lincoln International Business School, University of Lincoln, U.K

³Bengaluru City University, Bengaluru, India, and

Karnataka State Higher Education Council, Government of Karnataka, Bengaluru, India.

Suresh.Renukappa@wlv.ac.uk

A.D.MirandaHerrero@wlv.ac.uk

S.Subashini@wlv.ac.uk

RSarraikh@lincoln.ac.uk

tntgowda@gmail.com

Summary

In recent years, sustainability has been increasingly incorporated at every fabric of the organisation. Construction organisations have a significant role in achieving the sustainability objectives. This has led to the new form of business model innovation considering sustainability aspects into the construction organisations goals and process for creating positive impact while reducing negative consequences for the environment and society while being cost-effective. This paper identified a list of the external pressure's construction organisations needs to innovate their business models, focused on sustainable practices. The research methodology adopted was a critical review of literature. Institutional theory framework was selected to classify and examine the factors influencing the adoption of the sustainable business model innovation for construction organisations. The external drivers for construction organisations to adopt sustainable business models are classified into coercive, mimetic, and normative pressures.

Keywords:

Business model innovation, Institutional theory, coercive pressures, mimetic pressures, and normative pressures

Track 30: Sustainable and Responsible Business

Word count: 6470

Introduction

Over the past 25 years, there has been a significant increase in awareness of the environmental impact of the construction industry on the environment (Steurer et al., 2007; Yilmaz et al., 2015). The industry contributes to nearly 40% of the world's CO₂ emissions from fuel combustion and 25% of all GHG emissions actively or passively. Nowadays, the sector is considered the number one consumer of resources, generation of waste and one of the minor sustainable sectors of the economy. (Blanco et al., 2021; Yilmaz et al., 2015; Nuñez-Cacho et al., 2018). Thus, we can imply that the construction sector has a significant role in achieving the world's sustainability objectives because it is one of the

largest economic ecosystems in the world (Blanco et al., 2021). To understand how these objectives for the industry can be accomplished, we must understand the sustainability concept.

According to the World Commission on Environment and Development (WCED), the sustainability concept can be defined as “meeting the needs and expectations of the present without compromising future generations to meet their own needs and expectations”. Similarly, we must understand what a business model (BM) is. According to Kaplan (2012) has three essential elements: how an organisation creates, delivers, and captures value for its shareholders. Therefore, it seems that in this context, to change the construction sector’s current situation, it is necessary to change how it creates, delivers and captures value for all the stakeholders. This is done using a sustainable innovation approach for the BM, addressing these new economic and environmental challenges. Research done by Roome et al., (2016) describes the Sustainable Business Model (SBM) as a “process through which businesses and their managers develop new business models, how companies revise and transform their business model in order to contribute to sustainable development” through innovation.

A growing body of literature recognises the importance of Business Model Innovation (BMI) in the transformation of organisations (Schneider et al., 2013; Spieth, Schneckenberg et al., 2014; Hermes et al., 2019). That is why we have to define what is BMI. In agreement with Hermes et al., (2019), BMI can be best defined as “an effort to find new business logics that will help the company create and capture value for its stakeholders, emphasising the importance of an ecosystem perspective in determining new business logic”. Pohle and Chapman (2006) claim that in times of high environmental volatility, BMI has been identified as a promising approach to dealing with changing sources of value creation by firms. This led the companies to redefine the purpose of an organisation, developing mutually beneficial relationships with stakeholders and increasingly interacting with the market, which has contributed to organisations becoming more productive by rethinking their business models to create positive social and environmental change (Martinez et al., 2020).

Many market sectors, including construction, are attempting to adjust to this new situation (Acciarini et al., 2022; Barth et al., 2021; Matos et al., 2013; Barth, Ulvenblad et al., 2017; Whole Building Design Guide (WBDG), 2022; Ivic et al., 2021; Kaplan, 2012). The construction industry has many stakeholders, including clients, contractors, and suppliers, who participate in various stages and phases of a project. The result is a combination of the intensive use of resources and waste generation. (Treptow et al., 2022a). Given the scenario, it is crucial in the current business environment to understand the forces affecting organisational change in the construction industry. Although there is an urgency in the construction sector to make the industry more sustainable by adopting a sustainable business model innovation, the driving forces and performance remain unclear (Cai et al., 2018).

Sustainable innovations have the unique requirement that they work from a technical or organisational perspective, be cost-effective, and help to address sustainability issues. Boons et al. (2013) explain that this situation can generate two different innovation cases: one in which there is a change in an existing business model or one in which the innovation fits partially or entirely or neither. He argues that in the latter situation mentioned, there is a need to identify and understand the barriers to bringing a new business model. Furthermore, Boons and Lüdeke-Freund (2013) explain that “these barriers indicate that introducing a sustainable innovation requires that the companies take into account external barriers imposed by the wider environment of the respective production and consumption system”. Therefore, understanding the external drivers or pressures significantly impacts whether sustainable practices are adopted or not. In agreement with Martinez et al., (2020), external driving forces can be defined as the events, situations and particular contexts outside the organisations that impact the decision-making and business strategy. Understanding what factors motivate a specific phenomenon to advance a field of study is essential. This can be done by spotting new roadblocks, developing innovative solutions, and outlining the rationale for the phenomenon. This paper aims to

compile a list of the external factors that pressure the construction sector to innovate their business models, focused on sustainable practices in order to become legitimised.

Institutional Theory

There is an idea that homogeneity (isomorphism) between organisations is achieved for two causes. There is a sociological argument that imitators emphasise the crucial role that external institutional rules and belief systems play in motivating organisations that are intended to increase organisational legitimacy. On the other hand, the theory of transaction costs says that organisational behaviour should be rationally directed toward minimising both total production and transaction costs and how organisations strive for productivity and efficiency (Bruton et al., 2010; Fang et al., 2019).

Oliver (1997) argues that from an institutional standpoint, businesses operate within a social framework of values, norms, and presumptions over what constitutes proper or appropriate economic behaviour. Additionally, this behaviour is constrained by socially constructed limits distinctly of a human origin, such as norms, habits, and customs, rather than just the economic decisions based on the technological, informational, and financial limits that older models emphasise (Dimaggio and Powell, 1983). Considering this, the institutional theory (IT) investigates this isomorphism from a sociological point of view and explains that organisational isomorphism increases legitimacy, according to a core principle of the sociological variant of institutional theory (Kauppi, 2013). Essentially, the institutional theory asserts that firms are homogeneous in their structure and activities because they tend to conform to dominant norms, traditions, and social influences in their internal and external environments. Successful firms, on the other hand, gain legitimacy by conforming to social pressures, which leads to support and legitimacy (Oliver, 1997; Dimaggio and Powell, 1983).

Dimaggio and Powell (1983) proposed to analyse this phenomenon by examining the three isomorphic change mechanisms: coercive, normative, and mimetic, influencing how the business innovates its business models for sustainability to achieve legitimacy and success. External factors/drivers or pressures organisations receive to change for a more sustainable business model for sustainability relate to influences generated outside the organisation's environment that drive the change.

Coercive pressure is “pressures exerted on organisations by other organisations upon which they are dependent” (Dimaggio and Powell, 1983). Normative IT pressure can be defined as “arise from values and standards of conduct promoted by professional networks, industry associations, and academic institutions” “arise from values and standards of conduct promoted by professional networks, industry associations, and academic institutions.” (Hoejmose et al., 2014). Mimetic institutional pressure results from firms copying and imitating their competitors, which is a standard response to uncertainty (Dimaggio and Powell, 1983).

Research Methodology

This research aims to identify the external drivers for adopting business innovation models for sustainability in construction sector. The literature review will be conducted through the lens of institutional theory. However, there are several theories applied to explore and analyse sustainable business models, like the stakeholder theory (Chen et al., 2022) or the Resource-Based View (RBV) theory (Bamgbade et al., 2019a) or frameworks that only focus only on the perspective of a few companies and did not allow the results to be generalised (Treptow et al., 2022b). The institutional theory framework was selected due to its exploratory characteristics and power in classification and examination. Therefore, this helped classify and examine the factors influencing the adoption of the sustainable business model innovation for construction sector.

Borrowing theories from other fields so that the study of the topic can be enriched and widened is a common perception that borrows from other fields (Kauppi, 2013). The potential value of institutional theory has been identified by scholars in business, management and strategic corporate social responsibility (CSR) as a form to provide a non-economic explanation of organisational behaviours and strategies (Oliver, 1997; Yang et al., 2014; DiMaggio and Powell, 1983; Martinez et al., 2020; Kauppi, 2013). Nevertheless, institutional pressures have been studied in general management, strategy, and organisational behaviour literature for a while, but applications in construction and SBM innovation have been rare. In particular, this paper strives to advance understanding of institutional theory and its explanatory value in the context of SBM innovation in the construction sector by presenting central research avenues that have yet to be explored.

A critical literature review was conducted in three phases using secondary data. The initial search was conducted in different databases using elicit as a search engine to find the most relevant literature on the subject, containing academic papers, journals and conference proceedings. The search string is as follows: TITLE-ABS-KEY (Drivers OR Motive AND Sustainable OR Circular Economy OR Sustainability AND Business model innovation AND Construction OR Built Environment OR AECO). Afterwards, the open-access filter was applied to ensure access to the documents for the next step. Then another criterion of selection was utilised. This involved a screening method by reviewing the abstracts to ensure the discussion of the enablers of business model innovation for sustainability, which resulted in a total sample was 17 Journal articles. Finally, the drivers were analysed and classified using an institutional theory (see Figure 1).

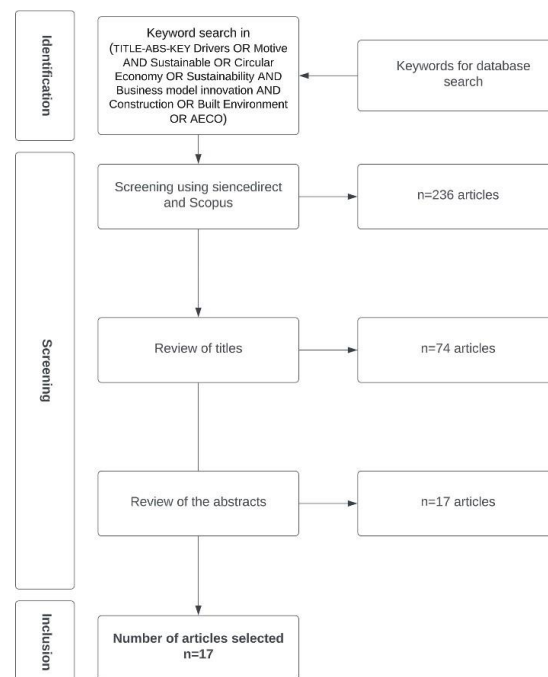


Figure 1: Data Collection Methodology

Discussion of External Drivers for Sustainable Business Model Innovation in Construction

Organisations begin implementing sustainability initiatives as coercive, normative, and sociocultural pressures from the outside world increase. The external factors from outside the organisations affect internal actions. As a result, they change how they do business, changing for more sustainable business models through innovation (See Table 1). Those pressures are called (exogenous). The external drivers for construction companies to adopt sustainable business models will be classified into the market, social, and regulatory.

Table 1: Regulatory Pressures

Regulatory Pressure	Description
Government Regulatory and Policies Compliance	The worry is that breaking the standards could cost organisation money in fines, penalties, or legal fees. Policymakers are in charge of issuing regulations regarding employment practises, workplace conditions, and sustainable development (Hart et al., 2019; Jensen, 2017; Koebel et al., 2015; Giorgi et al., 2022; Zhang, Oo and Lim, 2019; Bamgbade et al., 2019b; Bao, 2023; Ebolor, Agarwal and Brem, 2022; van Beers, Knorringa and Leliveld, 2012; Lakys et al., 2022; Hazarika and Zhang, 2019).
Professional/trade associations	There are sets of demands put forth by trade or professional associations that put pressure on organisations. Penalties and removal from the membership list may result from non-compliance. Benefits such as access to international markets can result from compliance (Hart et al., 2019; Zhao, Hwang and Lu, 2018; Zhao, Pan and Lu, 2016; Lakys et al., 2022)
Certifications	Pursuing voluntary certifications like ISO, LEED, and BREEM certificates force businesses to change their business models to become more ecologically and socially sustainable enterprises driven by the needs of customers and other stakeholders (Hart et al., 2019; Zhao, Hwang and Lu, 2018; Zhao, Pan and Lu, 2016).

Regulatory Pressures

The literature shows that governments, professional or trade associations and other regulatory bodies impose both formal and informal requirements to enable the innovation and development of sustainable business models in construction (Hart et al., 2019; Jensen, 2017; Koebel et al., 2015; Giorgi et al., 2022; Zhang, Oo and Lim, 2019; Bamgbade et al., 2019b; Bao, 2023; Ebolor, Agarwal and Brem, 2022; van Beers, Knorringa and Leliveld, 2012; Lakys et al., 2022; Hazarika and Zhang, 2019).

Armstrong et al. (2017) conducted a study and determined that the National Construction Code (NCC) is a performance-based code for building and plumbing by the Australian Building Codes Board (ABCB), facilitates the increase in performance and sustainability of construction by regulating the energy efficiency of buildings the regulation has the potential to become a

showcase for how a PBC system should function. He concludes by stating that “the industry associations and regulators play a key role in developing a performance mindset for future generations, enabling openness to innovative solutions and new approaches to delivering sustainable and innovative solutions”. Another example is the study by Zhang et al. (2019) researched Corporate social responsibility (CSR) in construction enterprises. They noted that not only regulations and policies are drivers for SBMI but also noted that governments introduce regulations for environmental preservation and human-wellbeing of the local communities like the one launched by the UK in 2005, “International strategic framework into CSR”, that include those kinds of practices. Furthermore, he stated that regulations and policies could motivate enterprises by promoting tax returns for corporate sponsorship of charities and community developments. Bao (2023) supported the notion that emerging economies should implement both decisive government intervention and economic incentives in order to be able to have good construction waste management. He argues that recycling is more feasibly achievable compared to reduction and reuse. (Bamgbade et al., 2019b; Ebolor et al., 2022; Hazarika et al., 2019; Lakys et al., 2022) found strong empirical evidence on the effects of government regulatory frameworks and the effects on business models for sustainability and how they have contributed to outstanding performance and innovation in the construction business.

Ebolor et al. (2022) conducted a study to determine the impact of sustainable development using a frugal innovation theory perspective that says that to make the products more affordable, we must take out of them the unnecessary luxuries in search of maximum utility from any resource (van Beers, Knorringa and Leliveld, 2012). He studied the hydraulic formation of blocks (Hydraforms) in Nigeria. The conclusions point to the role of laws and policies and how they exert pressure in promoting frugal innovation in the construction industry. Moreover, (Hazarika and Zhang, 2019) research on the factors that drive and sustain eco-innovation in the construction industry of Hong Kong observed that regulatory instruments positively impact both eco-innovative practices in the organisations in Hong Kong. He emphasised that “private firms in Hong Kong are so dependent on state-initiated actions, that with greater clarity of legislations regarding ‘non-compliance record of inspection’, and ‘fines and penalties’ it is assumed that eco-innovative performances of the firms would improve”.

Certifications and accreditations can also be considered regulatory pressures (Hart et al., 2019; Zhao, Hwang and Lu, 2018; Zhao, Pan and Lu, 2016; Hazarika and Zhang, 2019). For example, the certification ISO 45001 standard for health and safety is an international standard for health and safety at work developed by national and international standards committees independent of government. Also, professional bodies and associations can pressure construction companies to comply with the rules, such as the Building Research Establishment (BRE) and the World Building Council (WGBC). Furthermore, in research by (Zhao, Pan and Lu, 2016), a case study on business model innovation to deliver Zero Carbon Buildings (ZCB) is presented. The project is a 222,000-SF office building that was refurbished to be more energy efficient and compliant with the updated national energy requirements (thirty per cent better than ASHRAE 90.1).

Furthermore, the case study achieved the LEED Platinum standard, a certification given by the U.S. Green Building Council by adhering to prerequisites and credits that address carbon, energy, water, waste, transportation etc. (U.S. Green Building Council, n.d.). Each standard and certification consist of a set of guidelines, and organisations can obtain certifications by adhering to these guidelines. This is supported by Giorgi et al. (2022), who conducted a study and interviewed several stakeholders throughout the construction value chain. They analysed their strategies, supporting tools like waste management techniques, reversible building

strategies and circular business models. He focused the analysis of the study on the legislative framework, the public and private incentives and the innovation through digital technologies. The findings (Giorgi et al., 2022) showed the effectiveness of the organised measures and policies promoted by the European Commission. Furthermore, he emphasised that the current legal framework catalyses a waste management business model in construction that places a greater emphasis on recycling techniques like resource planning or material reuse.

For all those mentioned above concerning this type of pressure, we can conclude that this business model's sustainability drivers are consistent with institutional theory's findings that these pressures are a response to normative isomorphism (Frynas and Yamahaki, 2016).

Societal Pressures

Table 2: Societal Pressures

Societal Pressure	Description
Stakeholder pressures	How consumers approach the construction market and invest in construction has affected how organisations conduct business and how they deal with their sustainability performance. The increased public awareness of things like 'global warming' or 'environmental concerns' and 'air pollution' or 'water consumption'. The public, in general, puts tension on organisations to embrace sustainability methods to deliver their business. (Darko et al., 2017; Hart et al., 2019; Bamgbade et al., 2017; Zhang et al., 2019; Zhao et al., 2018)
Social well-being and community	Businesses are under pressure to implement sustainability initiatives that support meeting the needs of their workforce and the demands of surrounding communities (e.g., recreation areas, education institutions, NGOs, etc.). (Treptow et al., 2022c; van Beers et al., 2012)

As shown in Table 2, construction companies gain legitimacy through social innovations that improve their reputation and adequately manage their sustainable products. Due to being widely publicised and raising brand awareness, the social innovations in the civil construction companies under study aim to integrate with the community through incentives, particularly in the sports sector and thru donations, and how other groups like NGOs can drive companies to gain legitimacy (Treptow et al., 2022c; van Beers, Knorrington and Leliveld, 2012). Treptow et al. (2022c) noted that sustainable practices in the sector give them an economic benefit and position the company strategically with the different stakeholders. As a result, they observed a more significant presence in the market in addition to attracting more investment. Despite being concerned for society, the industry does not firmly commit itself to integration in developing a mutually beneficial partnership, limiting itself to a few specific benefits. Likewise, the NGOs conceptualise it as part of a plan that prevents the pursuit of material well-being through actions that endanger the environment, both now and in the future (van Beers, Knorrington and Leliveld, 2012).

Another reason mentioned by several authors is the pressures made by the stakeholders to make the construction organisation more sustainable (Darko, Zhang and Chan, 2017; Hart et al., 2019; Bamgbade, Kamaruddeen and Nawi, 2017; Zhang, Oo and Lim, 2019; Zhao et al., 2018). Meeting consumer needs is one of the most critical drivers for BMI for sustainability. The consensus among authors is that organisations focused on industry and technology have been

pushed to improve sustainability performance. When organisations adopt a customer-focused strategy for value creation, they must adjust to changes in customer values (Hart et al., 2019; Jensen, 2017). For example, Jensen (2017) studied how construction competition can contribute to the increase in innovation in the construction industry. Although each competition is highly tailored to the location, scope, and client requirements, there is still room for improved innovation transfer between projects. He cited an example from the Royal Institute of British Architects (RIBA), which, rather than just offering guidelines, actively manages architectural design competitions on behalf of clients. Zhao et al. (2018) identified 24 critical factors that influence the BMI for sustainable buildings and examined the factor using a fuzzy theory to determine the critical influencing factors. The findings support the idea that conforming to social pressures and adopting sustainable practices will get the intangible benefits of adopting SBM (e.g., brand value and public image).

An investigation on sustainable materials made by Lakys et al. (2022) in Kuwait discovered that customer awareness of sustainable practices is one of the factors in adopting the use of Compressed Earth Blocks (CEBs) as an alternative sustainable construction material. On the other hand, the findings also showed that although clients and practitioners have some readiness and willingness to innovate in using more sustainable construction materials, the lack of knowledge and awareness can be the most challenging barrier to sustainable practices.

These pressures can result in a response from the stakeholders to ensure their legitimacy and remain relevant in changing business environments.

Market and Environmental Pressure

Table 3: Market and environmental pressure

Market and Environmental Pressure	Description
Competitive advantage	Competitive advantage is gained by improving an organisation's social and environmental performance or developing environmentally friendly technologies. (Zhang et al., 2019; Zhao et al., 2018, 2012; Zhao et al., 2016; Zhao et al., 2018; Treptow et al., 2022c; Giorgi et al., 2022; Darko et al., 2017)
Suppliers' pressure / Value chain engagement activities	Sustainability goals across the supply chain cannot be achieved without supplier participation. In addition to exerting indirect pressure, they also assist organisations in implementing sustainability-related initiatives (Zhao et al., 2016 ; Zhao et al., 2015; Giorgi et al. 2022; Zhang et al., 2019; Darko et al., 2017)
Technological Innovation	Companies must reinvent their business models in response to technological changes to bring discoveries to market and meet unmet customer needs. (Hart et al., 2019; Zhao et al., 2016; Giorgi et al., 2022; van Beers et al., 2012; Ebolor et al., 2022; Hazarika et al., 2019)
Depletion of materials and resources	They modify the business model by producing less waste, emissions, and pollution while using fewer resources. (Zhao et al., 2012; van Beers et al., 2012; Ebolor et al., 2022; Bao, 2023; Adams et al., 2017; Hart et al., 2019; Zhao et al., 2016).

Businesses and their supply chains are under pressure from various market forces, including stakeholders in the value of chain and suppliers, to develop sustainable technologies and gain a competitive advantage (See Table 3). In today's increasingly fierce construction markets, the success of businesses depends heavily on their ability to satisfy their customers' needs. Contrary to other industries, shareholders and end users are clients of the construction, and their requirements and expectations must be met. Organisations improve their social and environmental performance or develop environmentally friendly technologies to gain a competitive advantage over their competitors (Zhang, Oo and Lim, 2019; Zhao et al., 2018, 2012; Zhao, Pan and Lu, 2016; Zhao, Hwang and Lu, 2018; Treptow et al., 2022c; Giorgi et al., 2022; Darko, Zhang and Chan, 2017). Development in technological advancements and innovation can also act as a driver, particularly in terms of ecological sustainability. Introducing technological innovations to the market enables businesses to upend industries and gain a competitive advantage. It might imply, for example, implementing appropriate research and development strategies for building design to enhance power consumption, utilising new construction techniques and technology, and acquiring eco-friendly resources (Hart et al., 2019; Zhao, Pan and Lu, 2016; Giorgi et al., 2022; van Beers, Knorringa and Leliveld, 2012; Ebolor, Agarwal and Brem, 2022; Hazarika and Zhang, 2019). Findings from Zhao et al. (2016) explained how using a Zero carbon building (ZCB) changed how companies offer value to the customers and how they capture value. Throughout the research study, using a design-build framework encouraged the competing teams to include energy efficiency as a minimum requirement while assuring owners that the proposals would be financially viable. The organisation gain a competitive advantage by acquiring experience in a new innovative way of designing for high-performance building in a collaborative manner. Additionally, a significant project's business model's highlights were the innovation of the procedures and tasks. They developed a new procurement process with a design competition approach applied to the project. Hence, they had a competitive advantage by developing new technological innovations. Zhao et al., (2016); Zhao et al. (2015) discovered that the value network and partner network are additional innovative elements of the project's business model. During both studies, the findings pointed out that an integrated design approach uses various teams' expertise.

The Value chain engagement activities are mentioned by Giorgi et al. (2022) and Zhang et al. (2019), and Darko et al. (2017). They noted that linking with others to open new businesses based on product reuse/remanufacturing, supply chain interaction and coordination leads to better capabilities to increase sustainability value creation. There are specific instances of platforms for exchanging materials and fostering collaboration for the "circularity" of materials in the end-of-product life.

Throughout construction activities, energy and resources are used and extracted, waste materials are produced, pollution is created, the landscape is impacted, and new buildings and infrastructure are created. That is why this is one of the most critical enablers for innovation for sustainability in construction. The resource shortage in the construction industry prompts sustainability measures like the creation of more resource-saving procedures, water conservation in the construction process and building operation, minimising construction and demolition waste, lower energy consumption by encouraging a responsible utilisation of resources and promoting the use of renewable resources and alternative energy systems. They modify the business model by producing less waste, emissions, and pollution while using fewer resources (Zhao et al., 2012; van Beers, Knorringa and Leliveld, 2012; Ebolor, Agarwal and Brem, 2022; Bao, 2023; Adams et al., 2017; Hart et al., 2019; Zhao, Pan and Lu, 2016).

The aim of the study was to study in the literature the external factors/drivers or pressures organisations receive to change for a more sustainable business model for sustainability relate to influences generated outside the organisation's environment that drive the change (see Table 4).

Table 4: External drivers for business model innovation for sustainability

Isomorphic pressures	External drivers of business model innovation for sustainability
Coercive	Depletion of materials and resources
	Increased awareness of sustainability issues
	Government Regulatory and Policies Compliance
	Stakeholders pressure
	Social well-being and community
Mimetic	Competitive advantage
	Technology and Innovation
Normative	Professional/trade associations
	Suppliers' pressure / Value chain engagement activities

Conclusions and recommendations

This study investigated the external drivers for business model innovation for sustainability in the construction sector based on a systematic review of the literature that included 17 journal articles and conference papers. According to the content analysis, external institutions frequently influence or motivate construction businesses to establish and safeguard their legitimacy in accordance with social expectations. The identified drivers can be categorised into three categories: regulatory pressures, societal pressures, and market and environmental pressures. These drivers are mainly derived from external coercive or mimetic isomorphism processes as construction organisations are under coercive or mimetic pressures to implement, conform or emulate competitors' sustainable practices. Nine external drivers were identified and connected to the institutional theory. The construction at external drivers such as the depletion of materials and resources increased awareness of sustainability issues, government regulatory and policies compliance, stakeholders' pressure, and social well-being and community can be categorised as coercive pressures since they are exerted into the construction organisations by other organisations that they depend on to change their business models and conform to that pressures. Likewise, organisations respond to normative pressures such as professional/trade associations suppliers' pressure / Value chain engagement activities. Finally, the last categorisation, in theory, says that isomorphism in organisations occurs when the pressure results from copying and imitating the competition to respond to uncertainty. In this group, the BMI for sustainability in construction enabled organisations to get a competitive advantage over other organisations by developing technology and innovations.

References

Acciarini, C., Borelli, F., Capo, F., Cappa, F. and Sarrocco, C. (2022) Can digitalisation favour the emergence of innovative and sustainable business models? A qualitative exploration in the

automotive sector, *Journal of Strategy and Management*, Emerald Group Holdings Ltd., 15(3), pp. 335–352.

Adams, K. T., Osmani, M., Thorpe, T. and Thornback, J. (2017) Circular economy in construction: Current awareness, challenges and enablers, *Proceedings of Institution of Civil Engineers: Waste and Resource Management*, ICE Publishing, 170(1), pp. 15–24.

Armstrong, A., Wright, C., Ashe, B. and Nielsen, H. (2017) Enabling Innovation in Building Sustainability: Australia's National Construction Code, *Procedia Engineering*, No longer published by Elsevier, 180, pp. 320–330.

Bamgbade, J. A., Kamaruddeen, A. M. and Nawi, M. N. M. (2017) Towards environmental sustainability adoption in construction firms: An empirical analysis of market orientation and organisational innovativeness impacts, *Sustainable Cities and Society*, Elsevier Ltd, 32, pp. 486–495.

Bamgbade, J. A., Kamaruddeen, A. M., Nawi, M. N. M., Adeleke, A. Q., Salimon, M. G. and Ajibike, W. A. (2019a) Analysis of some factors driving ecological sustainability in construction firms, *Journal of Cleaner Production*, Elsevier, 208, pp. 1537–1545.

Bamgbade, J. A., Kamaruddeen, A. M., Nawi, M. N. M., Adeleke, A. Q., Salimon, M. G. and Ajibike, W. A. (2019b) Analysis of some factors driving ecological sustainability in construction firms, *Journal of Cleaner Production*, Elsevier, 208, pp. 1537–1545.

Bao, Z. (2023) Developing circularity of construction waste for a sustainable built environment in emerging economies: New insights from China, *Developments in the Built Environment*, Elsevier, 13, p. 100107.

Barth, H., Ulvenblad, P. O. and Ulvenblad, P. (2017) Towards a Conceptual Framework of Sustainable Business Model Innovation in the Agri-Food Sector: A Systematic Literature Review, *Sustainability* 2017, Vol. 9, Page 1620, Multidisciplinary Digital Publishing Institute, 9(9), p. 1620, Available from: <https://www.mdpi.com/2071-1050/9/9/1620/htm> (Accessed 4 December 2022).

Barth, H., Ulvenblad, P., Ulvenblad, P. O. and Hoveskog, M. (2021) Unpacking sustainable business models in the Swedish agricultural sector– the challenges of technological, social and organisational innovation, *Journal of Cleaner Production*, Elsevier, 304, p. 127004.

van Beers, C., Knorringa, P. and Leliveld, A. (2012) Frugal innovation in Africa: Tracking Unilever's washing-powder sachets, *African Dynamics*, Brill Academic Publishers, 11, pp. 59–77.

Blanco, J. L., Engel, H., Imhorst, F., João Ribeirinho, M. and Sjödin, E. (2021) Seizing the decarbonisation opportunity in construction | McKinsey, Available from: <https://www.mckinsey.com/industries/engineering-construction-and-building-materials/our-insights/call-for-action-seizing-the-decarbonization-opportunity-in-construction> (Accessed 22 November 2022).

Boons, F. and Lüdeke-Freund, F. (2013) Business models for sustainable innovation: state-of-the-art and steps towards a research agenda, *Journal of Cleaner Production*, Elsevier, 45, pp. 9–19.

Bruton, G. D., Ahlstrom, D. and Li, H. L. (2010) Institutional theory and entrepreneurship: Where are we now and where do we need to move in the future?, *Entrepreneurship: Theory and Practice*, Blackwell Publishing Inc., 34(3), pp. 421–440.

- Cai, W. and Li, G. (2018) The drivers of eco-innovation and its impact on performance: Evidence from China, *Journal of Cleaner Production*, Elsevier, 176, pp. 110–118.
- Chen, Y., Cai, X., Li, J., Lin, P., Song, H., Liu, G., Cao, D. and Ma, X. (2022) The values and barriers of BIM implementation combination evaluation based on stakeholder theory: a study in China, *Engineering, Construction and Architectural Management*, Emerald Group Holdings Ltd., ahead-of-print(ahead-of- print).
- Darko, A., Zhang, C. and Chan, A. P. C. (2017) Drivers for green building: A review of empirical studies, *Habitat International*, Elsevier Ltd, pp. 34–49.
- DiMaggio, P. J. and Powell, W. W. (1983) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields, *American Sociological Review*, SAGE Publications, 48(2), p. 147.
- Dimaggio, P. J. and Powell, W. W. (1983) The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields, Source: *American Sociological Review*, 48(2), pp. 147– 160.
- Ebolor, A., Agarwal, N. and Brem, A. (2022) Sustainable development in the construction industry: The role of frugal innovation, *Journal of Cleaner Production*, Elsevier, 380, p. 134922.
- Fang, Q., Chen, L., Zeng, D. and Zhang, L. (2019) Drivers of Professional Service Model Innovation in the Chinese Construction Industry, *Sustainability (Switzerland)*, MDPI, 11(4).
- Frynas, J. G. and Yamahaki, C. (2016) Corporate social responsibility: Review and roadmap of theoretical perspectives, *Business Ethics*, Wiley-Blackwell Publishing Ltd, 25(3), pp. 258–285.
- Giorgi, S., Lavagna, M., Wang, K., Osmani, M., Liu, G. and Campioli, A. (2022) Drivers and barriers towards circular economy in the building sector: Stakeholder interviews and analysis of five European countries policies and practices, *Journal of Cleaner Production*, Elsevier Ltd, 336.
- Hart, J., Adams, K., Giesekam, J., Tingley, D. D. and Pomponi, F. (2019) Barriers and drivers in a circular economy: The case of the built environment, In *Procedia CIRP*, Elsevier B.V., pp. 619–624.
- Hazarika, N. and Zhang, X. (2019) Factors that drive and sustain eco-innovation in the construction industry: The case of Hong Kong, *Journal of Cleaner Production*, Elsevier, 238, p. 117816.
- Hermes, S., Böhm, M. and Krcmar, H. (2019) Business Model Innovation and Stakeholder Exploring Mechanisms and Outcomes of Value Creation and Destruction, In pp. 1754–1768.
- Hoejmose, S. U., Grosvold, J. and Millington, A. (2014) The effect of institutional pressure on cooperative and coercive ‘green’ supply chain practices, *Journal of Purchasing and Supply Management*, Pergamon, 20(4), pp. 215–224.
- Ivic, A., Nína, ·, Saviolidis, M., Lara Johannsdottir, · and Johannsdottir, L. (2021) Drivers of sustainability practices and contributions to sustainable development evident in sustainability reports of European mining companies, *Discover Sustainability* 2021 2:1, Springer, 2(1), pp. 1–20, Available from: <https://link.springer.com/article/10.1007/s43621-021-00025-y> (Accessed 22 November 2022).
- Jensen, C. A. (2017) Staged Competition as a Driver of Construction Innovation, *Procedia Engineering*, No longer published by Elsevier, 196, pp. 872–879.

Kaplan, S. (2012) *The Business Model Innovation Factory: How to Stay Relevant When The World is Changing*, John Wiley & Sons.

Kauppi, K. (2013) Extending the use of institutional theory in operations and supply chain management research: Review and research suggestions, *International Journal of Operations and Production Management*, 33(10), pp. 1318–1345.

Koebel, C. T., McCoy, A. P., Sanderford, A. R., Franck, C. T. and Keefe, M. J. (2015) Diffusion of green building technologies in new housing construction, *Energy and Buildings*, Elsevier Ltd, 97, pp. 175–185.

Lakys, R. E., Saad, A., Ahmed, T. and Yassin, M. H. (2022) Investigating the drivers and acceptance of sustainable materials in Kuwait: A case study of CEB, *Case Studies in Construction Materials*, Elsevier, 17, p. e01330.

Martinez G, Renukappa S and Suresh S (2020) External Drivers For Business Model Innovation For Sustainability: An Institutional Theory Perspective, In *Alliance Manchester Business School*, pp. 2–4.

Matos, S. and Silvestre, B. S. (2013) Managing stakeholder relations when developing sustainable business models: the case of the Brazilian energy sector, *Journal of Cleaner Production*, Elsevier, 45, pp. 61–73.

Nuñez-Cacho, P., Górecki, J., Molina-Moreno, V. and Corpas-Iglesias, F. A. (2018) What Gets Measured, Gets Done: Development of a Circular Economy Measurement Scale for Building Industry, undefined, *MDPI*, 10(7), Available from: www.mdpi.com/journal/sustainability (Accessed 22 November 2022).

Oliver, C. (1997) Sustainable competitive advantage: Combining institutional and resource-based views, *Strategic Management Journal*, John Wiley and Sons Inc., 18(9), pp. 697–713.

Pohle, G. and Chapman, M. (2006) IBM's global CEO report 2006: Business model innovation matters, *Strategy and Leadership*, 34(5), pp. 34–40.

Roome, N. and Louche, C. (2016) *Journeying Toward Business Models for Sustainability: A Conceptual Model Found Inside the Black Box of Organisational Transformation*, *Organization and Environment*, SAGE Publications Inc., 29(1), pp. 11–35.

Schneider, S. and Spieth, P. (2013) Business model innovation: Towards an integrated future research agenda, *International Journal of Innovation Management*, 17(1).

Spieth, P., Schneckenberg, D. and Ricart, J. E. (2014) Business model innovation - state of the art and future challenges for the field, *R and D Management*, Blackwell Publishing Ltd, 44(3), pp. 237–247.

Steurer, R. and Martinuzzi, A. (2007) From environmental plans to sustainable development strategies, *European Environment*, 17(3), pp. 147–151.

Treptow, I. C., Kneipp, J. M., Gomes, C. M., Kruglianskas, I., Favarin, R. R. and Fernandez-Jardón, C. M. (2022a) Business Model Innovation for Sustainable Value Creation in Construction Companies, *Sustainability* 2022, Vol. 14, Page 10101, Multidisciplinary Digital Publishing Institute, 14(16), p. 10101, Available from: <https://www.mdpi.com/2071-1050/14/16/10101/htm> (Accessed 4 December 2022).

Treptow, I. C., Kneipp, J. M., Gomes, C. M., Kruglianskas, I., Favarin, R. R. and Fernandez-Jardón, C. M. (2022b) Business Model Innovation for Sustainable Value Creation in Construction Companies, *Sustainability (Switzerland)*, MDPI, 14(16).

Treptow, I. C., Kneipp, J. M., Gomes, C. M., Kruglianskas, I., Favarin, R. R. and Fernandez-Jardón, C. M. (2022c) Business Model Innovation for Sustainable Value Creation in Construction Companies, *Sustainability* 2022, Vol. 14, Page 10101, Multidisciplinary Digital Publishing Institute, 14(16), p. 10101, [online] Available from: <https://www.mdpi.com/2071-1050/14/16/10101/htm> (Accessed 16 January 2023).

U.S. Green Building Council (n.d.) LEED rating system | U.S. Green Building Council, [online] Available from: <https://www.usgbc.org/leed> (Accessed 16 January 2023).

Whole Building Design Guide (WBDG) (2022) Building Information Modeling (BIM) | WBDG - Whole Building Design Guide, [online] Available from: <https://www.wbdg.org/bim> (Accessed 28 November 2022).

Yang, Z. and Su, C. (2014) Institutional theory in business marketing: A conceptual framework and future directions, *Industrial Marketing Management*, Elsevier, 43(5), pp. 721–725.

Yılmaz, M. and Bakış, A. (2015) Sustainability in Construction Sector, *Procedia - Social and Behavioral Sciences*, Elsevier, 195, pp. 2253–2262.

Zhang, Q., Oo, B. L. and Lim, B. T. H. (2019) Drivers, motivations, and barriers to the implementation of corporate social responsibility practices by construction enterprises : A review, *Journal of Cleaner Production*, Elsevier Ltd, pp. 563–584.

Zhao, X., Chang, T., Hwang, B. G. and Deng, X. (2018) Critical factors influencing business model innovation for sustainable buildings, *Sustainability* (Switzerland), MDPI, 10(1).

Zhao, X., Hwang, B. G. and Lu, Q. (2018) Typology of business model innovations for delivering zero carbon buildings, *Journal of Cleaner Production*, Elsevier Ltd, 196, pp. 1213–1226.

Zhao, X. and Pan, W. (2015) Delivering Zero Carbon Buildings: The Role of Innovative Business Models, *Procedia Engineering*, No longer published by Elsevier, 118, pp. 404–411.

Zhao, X., Pan, W. and Lu, W. (2016) Business model innovation for delivering zero carbon buildings, *Sustainable Cities and Society*, Elsevier Ltd, 27, pp. 253–262.

Zhao, Z. Y., Zhao, X. J., Davidson, K. and Zuo, J. (2012) A corporate social responsibility indicator system for construction enterprises, *Journal of Cleaner Production*, Elsevier Ltd, 29–30, pp. 277–289.