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Article

Exploring Leaders' Perceptions of the Business Case for Digitalisation in the Construction Industry

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Abstract: For decision-makers in construction organisations, it is imperative that persuasive business cases are formulated on matters of digital transformation. In fact, a link has been established between the low adoption of digitalisation in construction organisations and poor business case formation. Therefore, the purpose of this paper is to explore the cues that may facilitate the development of such a business case responsible for wider adoption. (1) Methodology: We utilised a purposive sampling method to gather qualitative data from 19 leaders of UK construction organisations. Analysis of the semi-structured interviews involves a thematic analysis through an inductive approach. (2) Findings: Overall, this exploration led to the emergence of nine themes, informing research on aspects that may contribute to substantiating a compelling business case behind the broader use of digitalisation in construction firms. The findings suggest that embracing such arguments would enable digital advocates to craft compelling arguments that may persuade decision-makers towards digitalisation. (3) Originality: This is the first paper in the construction domain to explore how building a robust business case that can justify adoption, offering digital advocates a set of cues that can be used to develop a successful relational capability to advance with their digital agendas. Thus, this study is a unique contribution to the literature, offering evidence that is otherwise understudied in the construction context.

Keywords: business case; digitalisation in construction; innovation adoption



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1. Introduction

Generally, digitalisation is revolutionising conventional processes and driving industries towards fundamental technological changes [1]. In the construction context, digitalisation is associated with benefits that unfold as a continuum of improvements in operational productivity [2], sustainability [3], and decision-making [4]. Mainly, benefits vary to include better safety [5], planning [6], carbon [7], and accuracy outcomes [8]. Statistically, this is evident in up to 91% increase in productivity [9], up to 30% reduction in environmental impacts [10], and up to 97% accuracy of data that supports informed decisions [11]. In contrast, other studies infer the drawbacks of digitalisation to include ambiguous return on investments [12], time-consuming learning curves [13], and security concerns [14]. However, the advantages of digitalisation outshine the perceived disadvantages, particularly in an industry described as lagging in achieving its key objectives [15]. The low innovation adoption rate in the construction industry, a sector perhaps most in need of these benefits, indicates that values alone do not necessarily justify innovation decisions. This is a phenomenon demonstrated in Rogers's [16] (p. 7) innovation diffusion theory, who argues that "innovations don't sell themselves." In fact, the adoption of innovations in construction is foreseen as even more complex and problematic than explained in Rogers theory [17]. This is motivating researchers to look beyond 'value creation', towards other means involved in decision-making that may facilitate more widespread digitalisation

in construction organisations. Hence, values associated with digitalisation are not to be ignored, but equally not to be taken for granted as justifications for adoption to occur.

One enduring challenge faced by digital advocates relates to their ability to communicate the need for innovations in terms of the benefits alone. This communication issue occurs primarily between digital advocates and those decision-makers seeking a robust justification for change [18]. Such a challenge has further complexity because of the patterns involved in construction processes [19], which means that even a small change may cause undesirable work deviations [20]. Moreover, the challenge becomes increasingly complicated within the financial constraints of construction organisations [21], making favourable decisions towards digital shifts harder to achieve and rationalise. To address this, research is needed to support digital advocates in their quest to persuade decision-makers to embark on digitalisation efforts [22]. Therefore, equipping digital advocates with provisions to aid their attempts to justify wider use of digitalisation in construction to such decision-makers is believed to be a vital research direction.

One of the routes taken by scholars is identifying business cases that justify adoption. As examples, Kumar et al. [23] emphasises the role of developing a business case for the adoption of sustainable lean manufacturing, Kumar et al. [24] for the adoption of resource planning systems, and Burke and Clark [25] for the adoption of integrated reporting. Such examples shed light on the possibility of reinforcing decision-makers' confidence by offering solid business cases that justify the need for transformation. A business case, in this context, would enable digital advocates to extend their actions through a focus on practical areas to persuade decision-makers. Such actions focus on the alignment that digitalisation accomplishes with the defined objectives of an organisation's strategies and plans. Therefore, a business case identified as feasible by decision-makers may assist advocates' endeavours toward wider digitalisation in the construction sector.

The following sections comprise a literature review, methodology and a representation of the data collected, analysis, and discussion, all of which contain the study's process in the search for the convincing decision-making factors that are believed to contribute to developing a persuasive business case for digitalisation in construction organisations. The study objectively presents the perspectives of 19 industry leaders from UK construction organisations, revealing the motives behind their agreement on the need for widespread use of digitalisation as an enabler for the sector's progression. The key research question of this study is:

RQ: What are the decision-making factors that contribute to building a compelling business case that justifies wider use of digitalisation in construction organisations?

2. Literature Review

2.1. Digitisation and Digitalisation

Firstly, it is important to define the key terms 'digitisation' and 'digitalisation'. Starting with digitisation, this refers to the transition from physical tasks to digital ones, while digitalisation, conversely, refers to a more developed use and comprehension of technologies in pursuit of value [26]. Digitalisation is the broader use of digital tools to realise value, and in turn influence fundamental organisational change [27]. Deriving value that influences organisational ability to compete and improve its key processes, therefore, renovates such technological change from an initially perceived luxury to a fundamental need for business survival [28]. Hence, these closely related concepts have different meanings.

For example, digitisation is the conversion of analogue information, such as physical documents and drawings, towards a digitally accessible format, sharable in a digitally represented manner, e.g., bytes and bits [22]. Digitalisation, however, is the transformation of the organisation to expand the generic transition to the use of a spectrum of digital technologies that are seen to provide critical values and competitive advantages, e.g., automation and visualisation [29]. In this context, digitalisation includes digitisation but also includes a wider use of the digitised data in integration with the business processes that impacts the overall business performance of an organisation. Such transformation

is dependent on digitisation, since it paves the way for digitalisation [30]. Digitalisation, therefore, is an innovation-adoption stance associated with multiple other changes needed to realise value from the technological uprise.

2.2. Digitalisation in Construction

From the lens of the literature, digitalisation in construction is seen as a gateway to addressing the industry's contemporary challenges. Incorporating digitalisation in construction has been linked to increasing efficiency [31], reducing costs [32], and boosting productivity [33]. The use of digitalisation is, moreover, facilitating informed decisions and collaboration among the various construction trades [34]. In the UK, a key driver behind the adoption of digitalisation is in seeking productivity enhancements it purports to realise [35]. This can be explained by the ramifications of the sectors 'productivity lag', seen, for example, in the housing crisis [21], an aspect that is mainly due to the industry's inability to meet rising demand [36]. Hence, digitalisation is being seen as a potential saviour and a promising change to the industry's current reputation.

2.3. Developing a Business Case

The use of the term 'business case' has seen an increase in the 1980s. This is because "during the 1980s and 1990s there were many inter-related changes in markets, technologies, employment practices and ideologies" [37] (p. 485). Producing a business case requires more than articulating benefits alone. Arguably, it is more about supplying accurate information to justify investment and proving that investing in innovation is meaningful for the organisation [38]. The issue of meaningful change has been described by Ness [37] (p. 488), who inferred it to be primarily shaped by the relationships with an organisation, stating that "no necessary relation exists between the words and the deeds". A business case in the construction context must achieve the ability to convince decision-makers to look beyond relative barriers [39]. Notably, Robinson et al. [40] argued the issue of reassurance and its widespread use among decision-makers as a condition for any purposeful action to occur. In construction, a motive that may substantiate radical change is not influenced by the sole existence of benefits in innovation, but rather by a business opportunity solid enough to justify adoption [41]. It is understood that a business case from the conventional viewpoint is defined as the approach of seeking financial profit [42], and therefore a 'business case of digitalisation' is seen as sharing a standpoint where the introduction of digitalisation would justify improvements in the financial performance of construction organisations. Overall, the literature points to drawing a metaphor that informs construction research and digital advocates on the areas that may promote an effective business case for digitalisation. Because of this, this paper conceives the term 'business case' from a similar viewpoint as Landrum [43] (p. 131), who states that "a business case is the motivation and measure of success", which includes "internal enforcement of activities" towards "incremental improvements" in order to fit in the "business-as-usual" stance.

Even amidst technological change, traditional models of strategy may still apply in some markets [44]. Nevertheless, in pursuit of a fundamental transformation, a robust business case that can envision and complement the disruptive and changing construction environment is essential, because "successful innovation ecosystems provide a viable business case for all actors involved" [45] (p. 7). For example, Zimina [46] (p. 391) argues for developing a business case that "... understand clients' needs (in terms of end customer value, the organisation's values and financial constraints)". Another example in construction is by Qian [47], who states that business development ideas that can reflect the business advantages of digitalisation while ensuring that no hidden opportunistic intentions exist among advocates are equally important. These arguments align with Winch [48] (p. 110): "unless this business case for investment is clearly articulated and defended through the project life cycle then the final facility will likely be a disappointment". Hence, aspects that can support advocate's capabilities to justify the business case of digitalisation are essential, but are as yet unexplored in relative research efforts.

Scholars echo the problematic and complex nature of developing compelling business cases in the narrative of construction innovations [49,50]. This is because the transition towards construction innovations is yet to reach the level of market orientation that is believed to rationalise adoption [51]. It is thus less about innovations themselves and more about the investment decision and the ability of advocates to guide these decisions towards construction innovations by shedding light on any business case [41]. This aligns with the work of Chan et al. [52], who emphasise the importance of a strategy that can directly influence business cases responsible for encouraging decision-makers towards modernisation in construction settings. Such encouragement is seen from various viewpoints in the literature, linking responsibilities to government [53], organisational culture [49], and customers [51]. In contrast, fewer studies focus on supporting the role of advocates and their efforts in accelerating the adoption of construction innovations, being described as the ‘dominant source of progress’ [54]. Therefore, a proposition towards digitalisation without the fundamental reasoning of factors deemed worthy is seen to limit any meaningful change.

2.4. Research Gap

Despite the increasing number of studies on digitalisation in the construction context, research gaps still exist. For example, scholars criticise the flow of research as chiefly focusing on technicalities associated with digitalisation, but in contrast, much less attention is given to social aspects of this phenomenon [17,55]. Recognising that key construction challenges are, to a large extent, adequately addressed by digitalisation [15,56], adoption rates are believed to be too slow and unsatisfactory to trigger industry change, more so because of social elements [57]. This aligns with the research by Zulu and Khosrowshahi [55], who call for an organisation-oriented approach when studying digitalisation and for the sole focus not to be on the innovations themselves. Hence, the extant research has a gap that this work addresses by exploring overlooked social and decision-making factors towards justifying the adoption and widespread use of digitalisation.

One of the key considerations that this paper proposes is revealing the factors that influence an effective business case behind the adoption of digitalisation. Digital advocates in construction organisations often struggle to justify the consequences of a radical change, and the literature is sparse on providing necessary evidence for driving decision-makers’ adoption decisions. By offering the comprehensive reasonings behind a compelling business case, this paper unravels the evidence needed to support digital advocates. This study, therefore, explores the viewpoints of construction leaders in relation to success factors that are effective in convincing decision-makers to adopt digitalisation. In turn, this knowledge can help improve the future business performance of construction organisations.

3. Methodology

Studies exploring digitalisation in construction organisations are rising [58]; however, studies focusing on decision-making for construction digitalisation remain scarce [5,59]. To address this, this work employs a qualitative approach underpinned by interpretivism, which has been described as highly effective when exploring opinions [60]. Data are collected by way of semi-structured interviews. This aligns with the qualitative stance adopted in enabling interviewees to share their perceptions spontaneously [61]. From the lens of the seminal methodological work of Eisenhardt [62], such a choice allows a better understanding of a social phenomenon. Therefore, an interpretivist qualitative method of research that utilises semi-structured interviews is believed to be highly valid for meeting the aims of this study.

Data collection included capturing the viewpoints of construction leaders holding managerial positions in pursuit of solid business cases for digitalisation. The sampling is seen from an actor–observer paradigm, which is informative in determining viewpoints on behaviour [63] and in turn reducing any bias from the authors [64]. Overall, 19 interviewees accepted invitations to participate in the study, providing a rich qualitative dataset. In terms of validating the sample size, qualitative methods are not validated based on any

particular test [65]. Conversely, data validity is achieved through saturation [66]. There is a lack of consensus on a single number that would determine such saturation [67–69], and qualitative studies have varied in the number of interviews to range between five and fifty [70–72]. Therefore, the sample size of this paper is believed to be adequate to provide a solid exploration, and the participants' details are shown in Table 1.

Table 1. Interviewees' roles and experience.

Number	Role	Organisation Type	Years of Experience
1	BIM Manager	Consultancy	Over 20 years
2	CDM Co-ordinator	Contracting	Over 10 years
3	Associate Director	Consultancy	Over 10 years
4	Senior Quantity Surveyor	Consultancy	Over 15 years
5	Director	Consultancy	Over 10 years
6	Equity Partner	Consultancy	Over 20 years
7	Director	Contracting	Over 20 years
8	Quality Manager	Contracting	Over 15 years
9	Managing Director	Contracting	Over 20 years
10	Change Agent	Contracting	Over 15 years
11	Director	Consultancy	Over 15 years
12	Director	Consultancy	Over 20 years
13	Director	Contracting	Over 10 years
14	Lead Advisor	Client	Over 20 years
15	Innovation Manager	Contracting	Over 15 years
16	Cost Management Lead	Consultancy	Over 20 years
17	Manager-Digital Projects	Consultancy	Over 10 years
18	Chief Financial Officer	Contracting	Over 20 years
19	Head of IT Operations	Contracting	Over 10 years

The selection of interviewees was achieved through a knowledge-exchange network comprising industry leaders and decision-makers. The participants are known to the authors and were invited based on their roles and expertise. The sampling was purposive and non-probabilistic, with the research team selecting participants that best suited the nature of the exploration required [73]. Each interview lasted between 30 min and 1 h, equipping the authors with a substantial amount of data for analysis (see Table A1). All of the participants agree that broader use of digitalisation has become necessary in their organisations amidst technological change in order to better pursue their objectives (see Table 2).

Table 2. Perceived benefits from the broader use of digitalisation.

Participant	More Control	Information Management	Enhanced Communication	Work Efficiency	Client Satisfaction
Participant 1	X	X		X	
Participant 2		X			X
Participant 3		X	X		
Participant 4	X			X	
Participant 5		X	X		
Participant 6			X	X	
Participant 7	X				X
Participant 8		X		X	
Participant 9			X	X	X
Participant 10	X	X			
Participant 11	X				X
Participant 12		X			X
Participant 13				X	X
Participant 14		X			

Table 2. Cont.

Participant	More Control	Information Management	Enhanced Communication	Work Efficiency	Client Satisfaction
Participant 15			X		
Participant 16		X			X
Participant 17	X			X	
Participant 18		X	X		
Participant 19	X	X		X	

4. Analysis

This section presents the analysis of the qualitative data obtained and justifies the use of an inductive thematic analysis relative to building a business case for digitalisation in construction organisations. As shown in Figure 1, findings are classified based on their importance to the textual data from the interviews, which aligns with the procedures for thematic analysis by Braun et al. [74]. The analysis uses an inductive approach of reasoning, where themes are derived from patterns and trends within the explored viewpoints [75]. Such an approach has been described as highly effective in the exploration of insights and perceptions [76]. This exploration, therefore, presents themes that are not based on predetermined constructs [77], but are instead formed subjectively based on recurrence and perceived significance in accordance with this study's aim. The identified themes include readily available potential, clear and quantifiable advantages, ability to attract more work, harmonisation, rationalisation, optimising disciplines and staff, client satisfaction, early benefits, and a manageable learning curve. The presentation and analysis of the qualitative data are consistent with the traditional approach described by Gill [78], who suggests separating the analysis of the themes from the relative discussions.

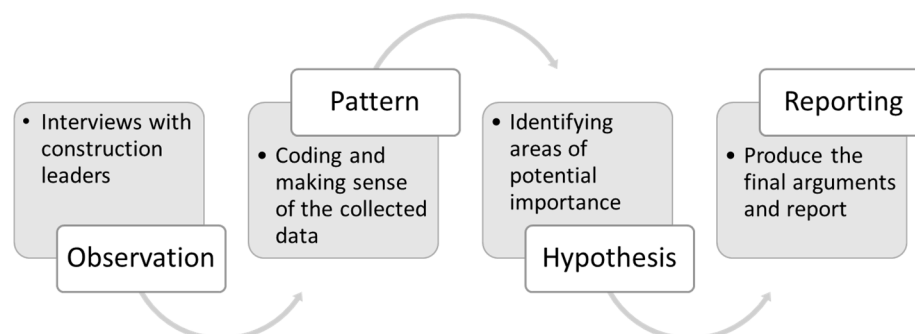


Figure 1. Process of the inductive reasoning adopted.

4.1. Readily Available Potential

From the interviews, a consensus is found on the readily available status of an organisation to welcome digitalisation as a potential departure point when building a business case for adoption. For instance, the existence of historic information and trained staff allows a faster adoption of digitalisation: “We’ve got historic information and we’ve got low fees . . . all of our technicians are trained” (P01). Having a level of maturity, therefore, accelerates substantiating the purpose behind more digitalisation: “It’s a service we can sell. And we’ve got the people in who can do that” (P02). The readiness to accept an innovation facilitates its adoption by driving more relevance: “Digitalisation has just complemented the work we’re already doing” (P03). Therefore, explaining the need for digitalisation in organisations that already have the resources that align with effective adoption can build a credible business case for digitalisation.

4.2. Clear and Quantifiable Advantages

A reasonable substantiation of a business case for the adoption of digitalisation in construction organisations is evidence of the associated benefits. To convince decision-

makers about the adoption of such an innovation, providing an overview of tangible values is critical: “A lot of people, certainly people that have been in industry for a long time, they want evidence that changing the way they work will do something different for them” (P05). This is believed to drive decisions: “If we can prove that benefit, they are all for it” (P15). Such a stance requires addressing decision-makers with values that matter to them: “It’s got to equate to something that makes their life better” (P05). Participants envisage that these benefits reflect time and cost savings and certainty. For instance, (P02) argues the former, and states “It might take someone a day, two days, three days to complete a task. If we’re using digital tools, we can do that task in half an hour” (P02), which aligns with (P07), who emphasises the potential of digitalisation to minimise time wastage: “They’re not running between office and site anymore, wasting their time.” Moreover, the time savings achieved are seen from the lens of cost, as “your time is money” (P11), where digitalisation’s ability to address delays is proving effective on both time and cost: “It cost us a lot of money at the final account stage because we couldn’t prove why there was a delay” (P19). Notably, (P08) links digitalisation to considerable cost savings: “We were able to save about £1.5 million worth of work being done and I can confirm that mainly because of using digital information and platforms.” Hence, it is reasonable to state that demonstrating benefits critical to organisations, such as time and money savings that directly link to digitalisation, strengthens any business case behind its adoption.

4.3. Ability to Attract More Work

From the lens of business, a link between an innovation and the ability to attract more work is seen as a critical factor when developing a business case for digitalisation in the construction context. Participants share their views on the same, where digitalisation is playing a vital role in driving demand: “We’re increasing like no tomorrow because we’re winning more projects. I think if we hadn’t got that digital capability, we wouldn’t be winning those projects” (P01). Such a stance prevails in organisations’ leading the transformation: “It will have helped us win work and it will continue to do so, as digitalisation gets more widely adopted. It should put us in a good position to continue winning work and stay at the forefront of the industry” (P02). Winning more work emerges as adequate cognitively for decision-makers to adopt digitalisation: “If we want to get that kind of work, then we should do it” (P13). A link, therefore, exists between digitalisation and the magnitude of business, which becomes evident through seeking competitive advantage—“Other companies in the same work, it sorts of helped them to market themselves, so potentially win them some jobs” (P04)—and being attractive to clients: “That capability will make you more attractive to clients. The whole world is driven by data and technology and stuff” (P09). Hence, digitalisation’s direct correlation with business attractiveness is a critical cue in the adoption of any business case.

4.4. Harmonisation

Another factor that can help in developing a credible business case for the adoption of digitalisation is seeking harmonisation among all stakeholders. Particularly, participants note the role that such innovations play in achieving harmony in a workplace: “We put it all together in one document, so there’s only one document to control in one place, so you know you can communicate OK” (P01). Harmonisation in this context is achieved through the accessible unification of processes: “You’ve got all the information together in one place, so you should be able to put a robust cost to that” (P02). Justifiably, it is the extent of cooperation that is unblocked due to digitalisation: “If they all had access to one common data environment that was shared through the supply chain, your supplier would know exactly what revision they’re working to because one particular drawing might have six/seven iterations” (P13). However, to achieve adequate harmonisation among all stakeholders, (P05) argues that a lack of guidelines can lead to complications: “If you don’t have some sort of framework around them and a framework around the whole team, making them work together, I think that it actually complicates what is already

quite a complicated process" (P05). Hence, harmonisation transpires as relatable to the context of this study as key when developing an effective business case for digitalisation in construction organisations.

4.5. Rationalisation

The environment surrounding the construction sector is not static, but rather changing as technologies advance, and the participants touch on the importance of comprehending urgency and need by rationalisation. Realising that the survival of an organisation depends on its proactivity to change is crucial: "Everybody's sceptic, but if we look back at them, the chances of them completing to the brief, and completing to the budget, and completing to the programme are really slim. But we don't acknowledge that. So, we always try and just do the same thing. But we try and refine it, but we expect a different result" (P05). Moreover, changes in an external environment would, logically, demand a change in the internal processes: "It's become mandatory now. You require to have a digital twin and you require to have a bit more information" (P08). Policy and standard mandates, being an example, put pressure on organisations to change: "The ISO standards really encapsulate much of the approach as well. So that's allowed us to understand and grasp those principles pretty well and pretty rapidly" (P14). To effectively embark on external change, it is critical to align internally: "We're pushing ahead with our digital agenda mainly because we need to redesign ourselves a little bit as a business to be more efficient to rise to some of the challenges that the industry faces" (P10). Achieving this, therefore, is through comprehending the need for continued change: "People have got to get up to a level where they understand enough about what's going on and next steps, what's coming next" (P16). Hence, participants shed light on the need to comprehend fitting in an external environment, which is critically facilitated by digitalisation and acts as another characteristic that contributes to any attractive business case.

4.6. Optimise Disciplines

Increased digitalisation in construction organisations is associated with a spectrum of optimisations to existing disciplines. The drive behind such optimisation is realising the risks of not proceeding with such change: "They're very reluctant to take that risk until they will have to essentially leave. They have no choice, which is often coming very fast" (P15). Such an advantage is key amidst an industry that struggles to recruit skills across its vast disciplines: "The industry is underqualified and under-resourced" (P07). In addition, digitalisation is proving effective in relieving organisations from this dependence: "If we can push it that way, that you could reduce potentially reduce your staff headcount because you have to software package, do the work for you" (P19). The dependence on skilful personnel is key to meeting an organisation's objectives: "If you want certain deliverables to be achieved, you need to ensure that competency exists in order to create those deliverables" (P14). Digitalisation has an impact on optimising key roles vary to include procurement ("It should strengthen the procurement department" (P07)), design ("Designers can see instantly what they've done" (P01)), and digital literacy ("Some guys hardly even use emails. It's all done in the old world where they've got a PC, but they don't even log on to it" (P18)). Hence, the opportunity to optimise disciplines and overcome skill shortages emerge to support any business case involving digitalisation within construction organisations.

4.7. Client Satisfaction

An extended ability to support and satisfy a construction organisation's clients may account for another important factor when building a business case for digitalisation. Firstly, digitalisation has been described as effective in supporting decision-making among clients: "The client can see what they're actually going to get and have a better feeling of space. That enabled the client to make decisions earlier than keep changing and redesigning when it's on site" (P01). This factor is argued to be as important as other attributes enabled by

digitalisation: “It’s not just about the productivity, it’s about the customer view as well and the customer experience” (P10). In addition, digitalisation is seen as a route to keep clients adequately updated, regardless of their location: “If you’re doing a project with a client that’s from the Far East and they want to know everything’s done right, then you can’t rely on Joe Bloggs to be filling out a coffee stain diary every day” (P13). Such flexibility was supported by P17: “Clients have their own sort of flexibility on what they want. So, they’ve really liked that.” These attributes associated with digitalisation, therefore, unlock an organisation’s potential to better serve their customer segments: “We’re reactive to what clients want and we’re able to influence the way that clients define what they want” (P05). Hence, extending construction organisations’ ability to better meet clients’ needs emerges as another cue in the business case of digitalisation.

4.8. Benefits of Being Early

Another important factor that may help in developing an effective business case for more digitalisation is the benefits gained from being among the early adopters. P02 contends that it could be cheaper to embrace digitalisation now rather than resist a transformation and end up paying more in the future: “It’s cheaper and easier to accommodate something before you’ve built it than trying to prevent something afterwards” (P02). In contrast, early adoption may be beneficial for those looking to be leaders of a promising transformation: “If someone gets on the bandwagon early, and starts getting into the system, yeah, there will be opportunities for contractors that take a lead on this” (P04). The benefits of being early are discussed to enhance an organisation’s readiness and coherence of the technological change: “To get the best out of them, really, you need to be earlier on than that and making that choice at a very early stage to enable the people to put the work in up front, to ensure that you get the best fit for that project” (P07). Moreover, those who are not early adopters are described to regret their indecisions: “They started to feel left behind. They then realised that they’ve got to get on board and start moving with it” (P01). Hence, the advantages associated with early adoption may as well reflect an important justification when building an attractive business case for digitalisation.

4.9. A Manageable Learning Curve

In addition to the benefits associated with embracing digitalisation, substantiating the forecast challenges and their manageability can be important factors for relevant business cases. Participants shed light on the key challenge of learning associated with digitalisation: “The problem is the learning curve: we’ve done lots of re-educating and the more projects that we’ve got on board, we’re finding that easier to stomach. Because now all the projects are in that environment, so they have no choice, so they are going to bite the bullet and go with it” (P01). However, P03 explains that such an issue is manageable: “We’ve developed a lot of toolkits, and people can access learning content and case studies with examples of other projects that other people have done, what’s going well, why it went so well. So, it’s pretty much a [one] stop shop with everything you would need to know” (P03). Similarly, the same approach has also been pursued by P07: “We’re generating work information packs and posting the information on the site in an understandable and legible manner”. Hence, despite learning curves associated with digitalisation being a challenge limiting wider adoption, the ability to convey and transfer knowledge exists as a solution, proving that such challenges are manageable and an important factor when building the business case.

5. Discussion

This section relates the results of these findings against previous research efforts. Building a compelling business case for digitalisation from the viewpoint of construction leaders can be through consolidating the meaning of such adoption between digital advocates and decision-makers. Overall, the findings support some aspects of the knowledge base. We then pinpoint the contribution of this paper.

The findings suggest that organisations with higher levels of readiness to embrace digitalisation through historical background and competent resources as selling points provide a better basis for advocates to explain the relevant business case behind its adoption. The differentiator, in this instance, is the qualifications of staff and personnel who are believed to be competent in driving effective transformation beyond adoption [79]. The argument herewith is that organisations who are halfway there can be seen to highly benefit from digitalisation as an extension to their work, minimising the challenges of a radical change, which may lead to adoption at a lower cost. This has been discussed by Davison et al. [80], who emphasise achieving alignment prior to adoption as a critical cue for effective digital transformation. Hence, establishing a business case for the use of digitalisation in construction organisations is facilitated by demonstrating readily available alignment of reception.

Establishing a direct relation between digitalisation and reductions in project time and costs would critically support developing business cases that substantiate adoption of digital adoptions in construction organisations. Our findings suggest the straightforwardness of these arguments as evidenced by the significant benefits associated with digitalisation. Upon proof of such benefits, digitalisation is seen as easily adoptable [81]. However, such adoption is dependent on how these benefits are sold to the decision-makers by quantification [82]. Respondents of this study shared in numbers the ability of digitalisation to save weeks and millions in time and cost, which are the critical selling points needed to link adoption with evidence [83]. Therefore, the quantification of the benefits, predominantly comprising time and money, are key aspects that would drive establishing strong business cases for adoption.

The findings establish a correlation between digitalisation and the extended ability to competitively win more projects in the construction marketplace. Such enhanced business performance attributes digitalisation to its ability to align with clients' wants and needs [84], and by that, achieve a higher competitive advantage [85]. Participants agree that showcasing digital capabilities helps their organisations gain more business compared to others that lag in achieving the same [86]. Therefore, the ability to win and attract more work due to digitalisation is a major selling point when building a business case of adoption.

The results also inform us on the capability of digitalisation to achieve harmonisation in a construction workplace among all stakeholders involved. Such harmony is established by the unification of data and processes in one easily accessible real-time location [87]. Moreover, having all information in one place enhances control and enables effective communication [88]. A shared data environment, therefore, is a critical success factor promoted by digitalisation in construction that yields agility [89], a feature that sustains fewer errors and more accuracy [15]. Hence, achieving harmonisation through having all information unified in one location that is easily accessible by stakeholders is another important characteristic when developing a business case for digitalisation in construction organisations.

Arguably, our findings highlight that digitalisation is a key factor in helping organisations align their internal processes with a continuously changing external environments. Examples of external changes influencing internal change can be policy and standard mandate [90], areas effectively addressed upon the adoption of digitalisation [91]. These arguments substantiate the increasing need for digitalisation as an enabler of construction organisations' survival [92]. The need for continuity in this exploration emerges as another potential characteristic of digitalisation when developing its business case.

The findings also reflect the potential of digitalisation in empowering disciplines within the workplace. Particularly, digitalisation is said to influence design [93] and procurement professionals [94] by allowing visualisation and simplification of information. Moreover, digitalisation is proving effective in addressing contemporary construction challenges, such as the shortages in skills [95,96], which aligns with Tripathi and Gupta [97], who emphasise the role of such a transformation in lessening the dependence on employees.

Hence, optimising existing construction disciplines and requiring fewer skills contribute to the business case when substantiating digitalisation in construction organisations.

A consensus among the respondents exists on the role digitalisation can play in meeting clients' wants and needs. The findings suggest that digitalisation is proving effective in enhancing customer experience and boosting collaboration between supply and demand [98]. This is achieved by allowing clients to better perceive their ideas and understand their needs, which enables them to make decisions not only faster but with certainty [99,100]. Our findings align with those of Ibrahim et al. [101], who discuss the role of digitalisation in defining clients' perceptions (often miscommunicated), thus leading to fewer changes and more customer satisfaction. Hence, building a business case that comprises such considerations for a construction organisation's client is seen as important and effective.

The benefits of being early adopters, moreover, transpire as another important factor when developing an effective business case. The findings suggest that the cost of preventing the diffusion of digitalisation across construction organisations may supersede the cost of embracing it. Moreover, it is clear that a consensus among the participants exists on the opportunities that are likely wasted in the situation of late adoption. This is explained by the rapid nature of technological change, as those lagging in adoption are believed to regret not taking an early initiative [79]. Hence, recognising the importance of the early adoption of digitalisation is a critical factor when building a business case in construction organisations.

Finally, the ability to overcome key challenges is an important aspect that can contribute to building an effective business case. One of the challenges associated with digitalisation is the learning curve involved in the transformation process [102]. The findings suggest that such a challenge is manageable, and the participants agree on the availability of multiple effective knowledge transfer strategies. These strategies vary to include easily accessible learning and education contents, toolkits, and information packs as ways to overcome the complexities associated with the learning curve. Hence, proof that solutions exist for key challenges facing wider digitalisation may as well contribute to the relative business case in construction organisations.

6. Conclusions

From the lens of business management, the low adoption of digitalisation in construction organisations lacks an in-depth exploration of recent research efforts. Chiefly, discourse centres on technicalities and digitalisation's attributes rather than the social aspects that are believed to be more subtle and embedded in the decision-making. Qualitatively, this paper reveals factors that are critical for digital advocates to persuade decision-makers through a language that best suits the latter, which is a substantiated business case that justifies adoption. The importance of the identified factors transpires, moreover, upon the comparison with previous seminal works to offer the body of knowledge the factors that are arguably more challenging to expose.

Put together, the findings of this study suggest rethinking the traditional models of justifying technological change. This can be approached by aligning the reasons for change with readily available organisational capabilities, offering clear and quantifiable advantages that reflect veracity, and substantiating that adoption would not only benefit the organisation internally but would influence the external environment by attracting broader business. The integration between internal and external environments is realised through harmonisation and rationalisation as key aspects that reinforce the business case through internal collaboration and external proactivity to change, respectively. Moreover, the optimisation of disciplines in an industry that is severely lacking workforce competence and is recording high rates of skill shortages also emerges as a key cue in building an effective business case for digitalisation. Finally, client satisfaction that ensures repeat business and long-term customer relationships is an obvious but highly important aspect associated with broader digitalisation in construction. All these characteristics then justify early adoption,

which then emerges as an aspect by itself, equipping digital advocates with sufficient cues to justify a compelling business case for digitalisation in their construction organisations.

To start with, the findings inform us that the digital readiness of an organisation may facilitate favourable decision-making. This is because of the lower expenses associated with transforming than those who are lagging more, and this alone is seen as a factor that may contribute to a compelling business case for adoption. Additionally, the ability to offer quantifiable and reliable data would help influence informed decisions and adds to the business case behind adoption. These advantages are predominantly savings in time and money. Moreover, the ability of digitalisation to emerge as a sole reason behind attracting further business, reasonably, vitally helps advocates in better substantiating adoption. Our findings establish a direct link between business attraction and the wider use of digitalisation.

Similarly, digitalisation is playing a critical role in fostering harmonisation and rationalisation in construction organisations, two key factors that can further evidence the importance of digitalisation. A lack of commonality has long been demonstrated to influence the smooth workflow in construction organisations, a challenge that is being adequately resolved using digitalisation and an element seen as important to substantiate its adoption. Our findings suggest that an uprise in harmonisation leads to a plummet in clashes, conflicts, and errors due to the common up-to-date digital environment that connects and manages multiple trades. Moreover, digitalisation is driving fundamental changes in organisations as a natural reflux towards achieving internal and external fit with both their processes and the external environment. The results inform us that with redesigning existing business models to incorporate digitalisation comes business improvements to better align with regulations and standards, as well as increasing anticipation and looking out for future opportunities, all of which are key when substantiating a convincing business case.

Digitalisation is furthermore associated with key capabilities that are highly compelling for a business case that justifies adoption. Amidst the tangible shortage in construction skills, digitalisation is seen as a gateway for downsizing without compromising existing and future workloads. The findings suggest that the reduction in trades overtaken by the higher use of digitalisation is an aspect that allows other trades to focus on optimising themselves. Moreover, digitalisation is enabling organisations to better serve and satisfy their customers, a critical extension of their abilities and a crucial element for business performance. Our findings also demonstrate that realising the benefits of early adoption and the awareness of the solutions that makes associated transformation challenges manageable are also factors believed to be important when developing a business case.

This study draws guidelines for those keen to adopt digitalisation but do not proceed with innovative decision-making due to the lack of persuasive business cases. Our findings comprise a set of arguments that can extend the purpose, legitimacy, and relative advantages of digitalisation in construction organisations, and as such, should be of interest to construction practitioners as well as researchers in understanding the requirements for advocates to advance their agendas and relational capabilities. Future research is also called for to quantitatively validate the factors presented in this study and to further give meaning behind the need for digitalisation and the creation of solid business cases that support innovation adoption. Future work can benefit from the application of a mature model that would distinguish the levels that distinguish different business propensities in accordance with the broader use of digitalisation.

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Appendix A

Table A1. Interview questions.

Interview Questions	
1.	What in your view have been some of the relative advantages of digitalisation in your organisation?
2.	To what extent is digitalisation compatible with your organisation's values and needs?
3.	What are the opportunities that your organisation can observe from the adoption of digitalisation in practice? How can digitalisation be better observed in the industry?
4.	To what extent can you recoup your investment in case digitalisation doesn't meet your needs? Does this fear exist in your organisation?
5.	What are the critical success factors for an effective digital transformation?
6.	Do you see your organisation increasing its digital adoption in the next few years? Why (drivers)? Why (barriers)?
7.	If you were to have a sit-down with the leadership in your organisation, what would you tell them are the top three things they need to do to accelerate digital transformation in your organisation?

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