Digital leadership in quantity surveying: unveiling key characteristics and their role in driving digital transformation

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ABSTRACT

This study delves into the critical role of digital leadership in driving digital transformation within the quantity surveying profession, which is increasingly influenced by technological advancements and the 4th Industrial Revolution imperatives. The aim is to identify essential digital leadership characteristics that facilitate this transformation and assess digital leadership's role in the process. The research is grounded in qualitative data from semi-structured interviews with directors of South African quantity surveying firms, using an interpretivist approach and an inductive methodology. This method, chosen for its depth and nuance, used thematic narrative analysis to uncover the core characteristics of digital leadership in these companies. The study's findings are eye-opening, revealing four critical digital leadership characteristics required for navigating the digital age's complexities: adaptability, motivational visionary, innovation, and urgency. These characteristics are consistent with the broader principles of transformational leadership and are essential for remaining relevant and competitive in a rapidly changing digital landscape. Leaders in quantity surveying firms have a positive attitude toward digital technologies, emphasising an urgent, innovative, and adaptable leadership style. However, the study acknowledges some limitations, most notably its focus on South African firms, which may limit the generalisability of its findings. Future studies with a broader geographic and sectoral scope are needed to validate and improve on these findings. Practically, the study provides valuable insights for quantity surveying firms. It emphasises the importance of developing digital leadership capabilities centred on the identified traits. Adaptability, visionary motivation, innovation, and urgency form a framework that guides leaders in managing digital transformation initiatives effectively. The study suggests fostering a learning culture, encouraging innovation, and instilling a sense of urgency in embracing digital changes. This paper adds new perspectives to the relatively unexplored field of digital leadership in the quantity surveying profession. It fills a significant gap in academic literature and professional practice by highlighting specific leadership traits required for digital transformation in this field. The findings and recommendations presented are useful to practitioners and academics, providing a more nuanced understanding of digital leadership dynamics in today's business environment. In essence, this study emphasises the critical importance of digital leadership in the quantity surveying profession, offering a nuanced perspective on the leadership characteristics required to guide these firms through the digital transformation journey. It highlights adaptability, a visionary approach, innovation, and a sense of urgency as key traits for effective digital leadership. It provides a road map for quantity surveying firms to navigate the digital era successfully.

Keywords: Digital leadership characteristics, Digital transformation, Industry 4.0, Quantity surveying, South Africa.

1.   INTRODUCTION

Marc Benioff, a pioneer in cloud computing and CEO of Salesforce, insightfully remarked, "We are in a leadership crisis. We are not in a technology crisis; we are in a technology revolution" (Barnato, 2016). This statement vividly captures the essence of our current era: a period of technological advancements and profound leadership challenges necessitated by the 4th Industrial Revolution.

As digitalisation swiftly reshapes the landscape, organisations worldwide grapple with the implications of Industry 4.0 (Zulu and Khosrowshahi, 2021). The significance of this shift is profound, as digital leadership becomes crucial for firms to adapt and thrive (Morgan and Papadonikolaki, 2022). Digital leadership, defined by El Sawy et al. (2016) as "doing the right things for the strategic success of digitalisation," involves guiding organisations through transformative changes. Despite the clear benefits, including enhanced operational efficiency and productivity (Asuquo et al., 2020), the construction industry's adoption of new technologies has been notably slow (Hoar et al., 2017). Previous research has emphasised the potential of digitalisation but has often overlooked the specific role of leadership in facilitating this transformation.

On the other hand, there is an evident gap in understanding the specifics of digital leadership, especially in the quantity surveying sector (Oberer and Erkollar, 2018). While the impacts of Industry 4.0 are recognised, the leadership response within quantity surveying remains tentative and passive (Shen and Chung, 2007). This gap raises critical questions about the nature and effectiveness of digital leadership in this field and the potential costs of adequately addressing these leadership challenges.

This research aims to explore digital leadership within the quantity surveying profession. Specifically, the objectives of the paper are to:

- Identify the digital leadership characteristics needed to drive digital transformation in quantity surveying firms and
- Establish whether digital leadership is key in digitally transforming quantity surveying firms.

The central argument of this paper is that effective digital leadership is crucial for navigating the transformative challenges of Industry 4.0, particularly in the quantity surveying profession. The failure to understand and implement this form of leadership could significantly hinder the industry's progress and adaptability.

In the subsequent sections, this paper will thoroughly review the existing literature, followed by a detailed description of the research methodology employed. This will be succeeded by an in-depth discussion emphasising the significance and anticipated implications of the study.

2.   LITERATURE REVIEW

The literature review in this paper reviews digital transformation and leadership in the construction industry and quantity surveying profession. It explores digital change's driving forces, benefits, and barriers, focusing on operational efficiency, customer engagement, and innovation. The review also discusses digital leadership, its characteristics, roles, and impacts, and the challenges leaders face in implementing digital strategies.

2.1   Digital transformation
2.1.1   Driving forces of digital transformation
Understanding the driving forces of digital transformation is critical for digital leaders. It assists in determining why a significant shift has occurred for firms to transform digitally. Verhoef et al. (2021) identify three external driving factors for digital transformation in businesses: the World Wide Web and associated technologies, company competition, and consumer digital technology behaviours. As a result, technology is not the only driving factor

in achieving digital transformation; other factors must also be considered (Adekunle et al., 2021). Kane (2019) states that people are the key to digital transformation. As a result, leaders are critical in guiding organisations through digital transformation.

Competition is a major motivator for digital transformation, particularly in the construction industry (Maduka et al., 2018). Organisations are battling to remain relevant and keep up with the most recent new technologies (Král and Králová, 2016). Their organisational processes are under increased pressure to adapt to the unprecedented changes of Industry 4.0. (Zulu and Khosrowshahi, 2021). According to Fitzgerald et al. (2013), companies must succeed through digital transformation in technology because failure will allow competitors to dominate. Organisations can only remain relevant and competitive if they drive digital transformation in their organisations.

Huang and Yen (2021) examined the driving forces of two companies and found three factors driving these companies to digital transformation. The first reason for companies to go digital was economic factors such as cost reduction and revenue generation (Huang and Yen, 2021). Businesses want to make a profit, which explains why they have a strong economic incentive to transform digitally. This agrees with the research of McKinsey and Company (2017) which stated that revenue is a major driving force for firms to transform digitally. The second driving force is social factors, such as shifting demographics and changing customer behaviour (Huang and Yen, 2021). This adds to the work of Verhoef et al. (2021), who identified consumer behaviour as a driving force. Technological factors such as proprietary technology advantages and new digital technology capabilities were identified as the third driving force (Huang and Yen, 2021). Workloads can be made easier by using digital technologies, while work can be completed more efficiently.

2.1.2   Benefits of digital transformation
Part of the driving forces of digital transformation is understanding the benefits that it will provide. Understanding the benefits will provide leaders with incentives to drive digital transformation. The business benefits of digital transformation include improved customer experiences and engagement, streamlined operations, and new lines of business or business models (Fitzgerald et al., 2013). The following were highlighted as key benefits of digital transformation in the construction industry: productivity improvements, cost reductions and innovation, better customer experiences and engagement, streamlined operations and new lines of business or business models, organisational efficiency, organisational agility, manufacturing innovation, product quality and safety, and process improvement, streamline workflow, and improved productivity (Adekunle et al., 2021). In the context of a PESTEL analysis framework, Klinc and Turk (2019) outline nine benefits of digital transformation in the construction industry: cost savings, time savings, on-time and on-budget delivery, improving quality, improving collaboration and communication, improving customer relationships, enhancing safety, improving the industry's image, and improving sustainability. These advantages boost construction efficiency, which saves money and time. These advantages from existing construction literature will also impact a quantity surveying firm. Suppose projects are completed on time and within budget using digital technologies. In that case, it would first provide a positive reputation for the quantity surveying firm, which would increase business. Secondly, more projects may be completed in a shorter time, thereby increasing business.

According to a McKinsey and Company (2017) survey, companies competing in digital ways have higher revenue rates than traditional ones. According to the findings of this survey, there is a positive relationship between companies that adopt higher levels of digitisation and digitalisation and a higher rate of revenue (Bughin et al., 2017). According to Fitzgerald et al. (2013), companies that are leaders in managing digital technology achieve the best financial results and highest revenues.

Digital transformation also requires a company to develop a "digital culture," which means that it will continue to learn and optimise its systems through the use of digital technology (Capuşneănu et al., 2021). Digital transformation, according to Capuşneănu et al. (2021), will reduce marketing costs, streamline workflow, and increase productivity and revenue.

2.2   Digital leadership, characteristics and barriers

This section explores digital leadership, a crucial concept in the digital era, especially in the quantity surveying profession and construction industry. It examines its defining characteristics, its role in digital transformation, and the barriers to its effective implementation. The section provides a comprehensive understanding of digital leadership, focusing on qualities and obstacles that hinder its progress offering insights into a less explored field.

2.2.1   What is digital leadership?

Digital leadership is a term that has recently been coined to describe someone who leads an organisation through a digital transformation and combines the transformational leadership style with the use of digital technologies (De Waal et al., 2016; Breuer and Szillat, 2019; Klein, 2020). El Sawy et al. (2016) define digital leadership as "doing the right things for the enterprise and its business ecosystem's strategic success of digitalisation." Another study defines digital leadership as a combination of digital culture and competence to drive change and capitalise on digital technology opportunities (Mihardjo et al., 2019). Digital leaders must consider business strategies, business models, and corporate information technology (IT) platform functions, thought patterns, abilities or skills in the workplace in new ways (Agung et al., 2020). A digital leader must prioritise the quality and usability of a company's digital assets (Breuer and Szillat, 2019).

As digital leadership has become a buzzword in recent years, many existing studies have attempted to understand and define what it is as well as its role in Industry 4.0 for organisations (Klein, 2020; Ehmig-Klassen and Schallmo, 2021). Digital leadership has been extensively researched in the business sector, with studies concluding that businesses must remain competitive (Breuer and Szillat, 2019; Mihardjo et al., 2019; Agung et al., 2020). However, there have been fewer studies on digital leadership in the built environment and the construction industry. Morgan and Papadonikolaki (2022) recently attempted to fill this void by completing a study on digital leadership in the built environment. A taxonomy of digital leadership in the construction industry was developed by Zulu and Khosrowshahi (2021) in a qualitative study. This study provides a valuable understanding of the influence that leaders have in driving digital transformation in the construction industry. However, no studies on digital leadership in quantity surveying have been found. Furthermore, no research has been conducted on the strategic implementation of digital leadership and the digital leadership traits required in the quantity surveying profession.

2.2.2   The importance of digital leadership

Digital leadership has been lacking in the construction industry and is an important factor in a firm's attempt to digitalise (Morgan and Papadonikolaki, 2022). Morgan and Papadonikolaki (2022) also suggest that digital leadership is a key aspect for companies to remain relevant and keep abreast with the changes of Industry 4.0. Leaders are critical in providing a vision and roadmap for digital transformation. Fitzgerald et al. (2013) state that lack of leadership skills contributes to there being so few leaders leading organisations through digital transformation. Culture, specifically a digital culture, is vital for companies to change from traditional methods to digital organisations (Kane, 2019). Kane (2019) later concludes that people are the real key to digital changes in organisations and that leaders need to have a shift in mindset to adopt digital transformation in their organisation.

Organisations that place high importance on digital leadership often give significant attention to communication, creativity, innovation, and a willingness to investigate new ways to use technology in their organisation (Breuer and Szillat, 2019). Karippur and Balaramachandran (2022) highlight the following seven benefits of effective digital leadership in an enterprise: providing a clear digital vision, nurturing the talent to derive and deliver digital strategy, being adept at aligning business and IT strategy, placing a higher focus on innovation and growth, making aggressive investment in agile and disruptive technologies, building on stable and secure infrastructure and building strategic partnerships. The digitisation of a firm, which includes the standardisation and integration of IT infrastructure, IT-enabled business processes and data, needs a combination of digital, market, business, and strategic leadership skills, which digital leadership can provide (Benitez et al., 2022). Benitez et al. (2022) conclude that digital leadership capability is positively associated with platform digitisation capability, which in turn is positively associated with innovation performance which is vital for businesses to innovate and outperform direct competitors.

2.2.3   *Digital leadership characteristics*

While extensively studied within the broader scope of business leadership, the notion of digital leadership characteristics has not been as rigorously interrogated within the specific context of the quantity surveying profession. This gap in the literature represents a significant oversight, given the distinct nuances and demands of digital transformation in this field. A critical review of the literature reveals a consensus around the significance of innovation and vision as hallmark characteristics of digital leadership (Fitzgerald et al., 2013; Temelkova, 2018; Breuer and Szillat, 2019; Mihardjo et al., 2019; Agung et al., 2020; Klein, 2020). However, the mere presence of these traits is insufficient without active and engaged leadership that not only recognises but also harnesses the transformative potential of digital technologies.

Empirical evidence suggests a troubling trend of passive and even obstructive leadership within the construction industry, with leaders often described as lacking clarity, motivation, and understanding of the digital transformation imperative (Zulu and Khosrowshahi, 2021). These findings echo Kane's (2019) assertion that the human element is paramount in digital transformation efforts. Without a concerted leadership drive, digital initiatives risk stalling before they can effect meaningful change. The participatory feedback from Zulu's (2021) study underscores leaders' critical role in endorsing and embodying the principles of digital transformation.

Agung et al. (2020) further delineate digital leadership into four actionable domains: Navigation, Connection, Relation, and Holistic Thinking, each representing a strategic area for leadership to influence digital change. Magesa and Jonathan's (2021) conceptual framework similarly identifies five key attributes: Visionary, Absorbing Uncertainty, Adaptation, Inspirational and Innovation required for digital leadership as depicted in Figure 1 as follows:
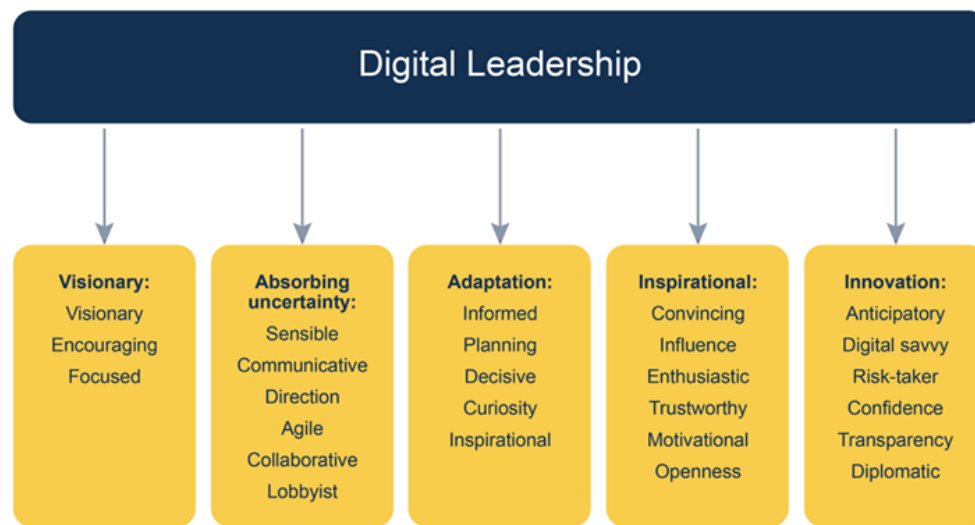
Figure 1. Digital leadership conceptual framework

However, while their research provides a valuable theoretical model, the practical application of these characteristics within the QS profession remains unexplored. Klein (2020) systematically categorises 23 digital leadership characteristics from a meta-analysis of 60 studies, highlighting 'innovative visionary' as the most pivotal.

The literature, although thorough in identifying characteristics of digital leadership, tends to generalise across industries without due consideration for domain-specific challenges, particularly in quantity surveying. For instance, Zulu and Khosrowshahi (2021) indicate that many espoused leadership traits are not commonly observed in the construction sector, suggesting a disconnect between theory and practice. This discrepancy underscores the necessity for empirical research to understand how digital leadership manifests within the quantity surveying profession, and whether the identified characteristics are applicable or require adaptation.

In sum, the extant literature substantiates the importance of digital leadership but falls short in critically evaluating the relevance and manifestation of these characteristics in the quantity surveying profession. There is a compelling need for in-depth research into the particularities of digital leadership within quantity surveying to identify and understand how to cultivate the characteristics that will enable quantity surveying leaders to guide their firms effectively through the nuances of digital transformation.

2.2.4   Digital leadership barriers

A profound understanding of the impediments to the implementation of digital leadership is instrumental in deciphering the inertia prevalent within the quantity surveying profession and the wider construction industry. Scholarly discourse has extensively catalogued barriers to digital transformation, identifying the shortfall in digital leadership as a primary concern (Fitzgerald et al., 2013; Klinc and Turk, 2019; Magesa and Jonathan, 2021; Favoretto et al., 2022; Morgan and Papadonikolaki, 2022).

In the literature, Horváth and Szabó (2019) delineate a spectrum of obstacles to digital transformation, ranging from human resource limitations to systemic organisational resistance. Notably, the reluctance of companies to embrace digital technologies has been attributed to uncertainties surrounding profitability and entrenched tendering systems. The researchers underscore resistance to change as the principal challenge and highlight the crucial role of leadership in addressing these barriers.

Zulu (2022) furthers this narrative by elucidating five thematic barriers that influence digital leadership enactment, potentially mirroring the challenges faced in digital transformation endeavours. Among these, the leadership characteristic influences, including a deficit in motivation and resistance to change, stand out as factors that could hinder the adoption of digital practices. Additionally, management and organisational structures pose significant hurdles, with a noted lack of strategic orientation and insufficient training programmes impeding the progress of digital innovation (Zulu, 2022).

Furthermore, technological barriers, such as leaders' limited grasp of technology, inadequate IT infrastructure, and resource constraints, have been identified as pivotal factors hindering the promotion of digital leadership. The literature concurs that the financial outlay required for digital technology investments often acts as a deterrent (Horváth and Szabó, 2019).

Leaders' risk perceptions and attitudes towards digital transformation are also highlighted as a significant barrier. A cautious or ill-informed approach to risk can prevent leaders from championing the digital transformation necessary for organisational growth and evolution (Zulu, 2022).

Jones et al. (2021) supplement this examination by focusing on the manufacturing sector, identifying entrenched mindsets as a significant barrier—a finding that resonates across industries, including quantity surveying and construction.

This body of work collectively emphasises the multifaceted nature of the barriers to digital leadership. However, the literature lacks an in-depth analysis of these barriers within the quantity surveying domain, necessitating further academic inquiry.

3.   RESEARCH METHODOLOGY

3.1   Research paradigm

The current study employed an interpretivist paradigm and an inductive approach. A semi-structured interview was used to collect qualitative data on the digital leadership characteristics required to transform quantity surveying firms in South Africa over a cross-sectional time horizon. Qualitative data was chosen for a more in-depth understanding of digital leadership in digitally transformed firms.

3.2   Population and sample

The study population comprised professionally registered directors of South African quantity surveying firms. The participants were chosen using non-probability sampling with purposive sampling. Quantity surveying practices in South Africa that had been digitally transformed and emphasised their reliance on digital technologies were identified. The directors of the firms were chosen for the sample because of their expertise in digital leadership. The study's participants have successfully driven digital transformation in their organisations and could provide valuable information about digital leadership characteristics.

3.3   Data collection methods

The data for this qualitative study was gathered through semi-structured interviews with professional quantity surveyors. Interviews allowed for a more in-depth look at the thoughts and opinions of a smaller sample size of professional quantity surveyors. The questions were created to elicit participants' thoughts and perceptions of digital transformation. As participants shared their personal experiences and points of view, this allowed for exploring various topics. During the interview, no mention of digital leadership characteristics was made to the participants. The participants' responses were used to identify the digital leadership characteristics.

3.4   Thematic analysis

Thematic narrative analysis represents a qualitative data analytical technique for extracting themes from narrative content. Within the scope of this study, the primary sources of the narrative were the interview transcripts. The process of theme derivation involved an initial phase of coding these interviews, followed by the formation of distinct categories emerging from the codes. Subsequently, the transcripts underwent a re-coding procedure, specifically focusing on the previously identified themes, to ensure comprehensive identification of pertinent data. Finally, for each delineated theme, the corresponding sections of the interviews were meticulously analysed to facilitate a deeper comprehension of the underlying narrative.

4.   FINDINGS AND DISCUSSION

4.1   Findings

Four themes emerged from the participants' thematic narrative analysis: Adaptability, motivational visionary, innovation, and urgency. These were critical digital leadership traits required to transform quantity surveying firms. (Figure 2):

Figure 2. Codes and categories for themes

4.1.1   Adaptable

The participants unanimously agreed that the most important characteristics of a digital leader are flexibility and adaptability to new technologies. As the company adapts to be at the forefront of moving with the times and embracing technology, one participant stated that they personally need to remain relevant and update themselves with new technologies:

"The ability as a leader to embrace new ideas because it's very easy over time to get stuck into certain ways."- Participant A

"I think it's a willingness to adopt new systems and to look at new systems and not to sort of be scared of them, but be willing to say, how can we improve this or get faster or quicker or better at this. You must not resist it. You need to look at it and consider it and look at implementing newer systems and improved systems." – Participant C

It is interesting to note that the participants are not rigid in their ways. They will pay careful attention to new technology and try to implement it if it will benefit their firm. Resisting change and not adapting has been the case in quantity surveying (Shen and Chung, 2007).

"I mean anything to do with digital transformation or development, you've got to be flexible." – Participant D

"Being adaptable, responding to changes and I think organisation skills are very important" – Participant E

"So, I think from a leadership point of view and characteristics, I've just got to make sure that I stay relevant as well" – Participant B

Magesa and Jonathan (2021) identified adaptation as a key digital leadership characteristic. The theme "Adaptable" is consistent with existing literature, as participants demonstrated this characteristic in their leadership approach to driving digital transformation in their firms. Klein (2020) concluded that adaptability was a general mindset shared by digital leaders. This was evident in the participants, who all demonstrated a willingness to adapt and be relevant.

4.1.2   Motivational visionary

All participants stated that their leadership style encourages and builds good employee relationships. The participants all took a positive approach to developing the people they lead by setting examples, being open to giving direction, and providing a vision when necessary:

"I've got a very open-door policy when it comes to leadership" – Participant B

"I motivate employees by setting a good example'' – Participant D

"I'm a leader, not a manager. So, people will follow you if you're encouraging them, leading them, helping them and if you're getting alongside them. If you're supporting them, they will follow you." – Participant C

"I motivate employees by making them feel important." – Participant E
"Every director in our company is a work winner or a go-getter and basically to keep people motivated to get to the level that they want to, which is leadership" – Participant B

"You've got to have a flexible mindset and you've got to also have a vision of what service and product you're trying to offer" – Participant D

"I think planning is an important characteristic" – Participant E

According to Magesa and Jonathan (2021), an encouraging leader will be a visionary leader. According to the participants, encouragement is a method of motivating their employees. As a result, it is possible to assert that providing motivation leads to vision. In a previous study, Klein (2020) classified innovation and vision as digital leadership characteristics. Participants in this study, on the other hand, demonstrated motivation while providing vision.

4.1.3   Innovative
The participants made no mention of innovation as a characteristic. This characteristic, however, can be seen in how they lead their firms to become more digitally transformed by allowing for creativity and introducing new technologies:

"So, what we do is, we encourage the guys that are passionate about digitisation or technology to run little workshops on a weekly basis on a Friday. And we use that spot to encourage people to come out with what they might have, what they are testing, what is new in the market and how it can help them with their projects." – Participant A

The following statement was mentioned for the "Adaptable" theme; however, it also shows how the participant was using the innovative leadership characteristic in adopting new systems:

"I think it's a willingness to adopt new systems and to look at new systems and not to sort of be scared of them, but be willing to say, how can we improve this or get faster or quicker or better at this. You must not resist it. You need to look at it and consider it and look at implementing newer systems and improved systems." - Participant C

Previous research has identified innovation as the most important digital leadership characteristic (Fitzgerald et al., 2013; Temelkova, 2018; Breuer and Szillat, 2019; Mihardjo et al., 2019; Agung et al., 2020; Klein, 2020). This was demonstrated once more by the participants. On the other hand, participants in this study did not mention being innovative as the most important characteristic, which contradicts previous research. Nonetheless, it is clear from their actions and words that this was a trait that the participants exhibited as digital leaders.

4.1.4   Urgency
The participants were optimistic about digital transformation and demonstrated a sense of urgency in driving digital transformation. They all agreed that in order to remain relevant, a quantity surveying firm must transform digitally. According to one participant, quantity surveyors must evolve with the times. According to reports, quantity surveying firms and the construction industry have generally been slow to adapt to the changes by Industry 4.0. Another participant stated that the COVID-19 pandemic has compelled businesses to consider digital transformation:

"I think we might be lagging a bit behind other industries, but especially with covid happening, we didn't have a choice" – Participant E

"So, look, I think as a QS company it's pretty critical (driving digital transformation) mainly because as a QS or QS companies in general, we've been pretty backward and slow to adjust to using

technology. I think within the construction industry we've been left behind and very slow to adapt to using any sort of digital technology. And it's made QS firms needing to, to catch up and adapt even more important." – Participant D

All participants stated that using digital technology provided them with a competitive advantage or increased efficiency in their business processes. Some participants believed that digital technology had saved significant time, which was critical in providing a quantity surveying service. This has been critical to their ability to compete and survive.

"So, if somebody you know is going to take five hours to do a job and the other guy using better technology is doing it in two hours, well then you are not going to be competitive in the market." - Participant A

"It's extremely competitive at the moment, and you have to be doing your tasks as efficiently as possible. You have to otherwise; you just can't survive." - Participant C

Prior research has not identified urgency as a direct digital leadership characteristic (Klein, 2020). However, some studies concluded that their leaders lacked urgency (Zulu and Khosrowshahi, 2021). There was a clear sense of urgency among the participants' perceptions of digital transformation. All of the participants agreed that quantity surveying firms needed to transform in order to remain digitally relevant.

4.2   Discussion

The thematic narrative analysis conducted with participants in this study revealed several key insights into digital leadership within the quantity surveying profession. Participants were observed to embody characteristics synonymous with transformational leadership, notably charisma, inspiration, intellectual stimulation, and individualised consideration. This aligns with Basu's (2012) findings and supports the assertion from Mihardjo et al. (2019) that the transformational leadership style is highly compatible with digital leadership.

A prominent theme throughout the participants' responses was their favourable disposition towards digital technologies and the benefits they offer. This viewpoint is consistent with existing literature on digital leadership in businesses, as noted by Breuer and Szillat (2019), Mihardjo et al. (2019), and Agung et al. (2020), which emphasises the crucial role of digital transformation in maintaining the relevance and competitiveness of quantity surveying firms.

Furthermore, the study participants consistently demonstrated key digital leadership characteristics identified in prior research, namely innovation and vision. These traits are essential for driving digital transformation, as supported by studies from Fitzgerald et al. (2013), Temelkova (2018), and Klein (2020). The participants' emphasis on innovation and visionary leadership resonates well with this existing body of research, underlining the importance of these characteristics in digital leadership.

However, a unique perspective emerged from this study, highlighting adaptability and flexibility as paramount for digital leadership in the quantity surveying context. This finding diverges somewhat from the existing literature, which typically emphasises innovation and visionary leadership. The distinct focus on adaptability in this study can be attributed to the traditionally rigid and slow-to-change nature of the construction industry, as noted by Asuquo et al. (2020).

Additionally, the study unearthed 'urgency' as a new and critical characteristic of digital leadership in quantity surveying. As expressed by the participants, this sense of urgency underscores the immediate need for digital leadership in driving transformation within the sector. This finding marks a novel contribution to the digital leadership discourse, expanding

the existing framework to include urgency as a pivotal trait, which had not been distinctly identified in prior research.

While this study corroborates many aspects of the existing literature on digital leadership, it also offers new insights specific to quantity surveying, particularly emphasising adaptability, flexibility, and urgency in navigating the digital transformation landscape.

5.   CONCLUSION AND RECOMMENDATION

5.1   Conclusion

Objective 1 of this study was to delineate the characteristics of digital leadership pivotal for facilitating digital transformation within the domain of quantity surveying firms. The methodological approach employed, namely thematic narrative analysis, enabled the extraction of four fundamental traits that epitomise digital leadership in this context: adaptability, motivational visionary, innovation, and urgency.

Adaptability emerged as a cornerstone characteristic. The unanimous consensus among participants regarding the necessity of flexibility and adaptability in embracing emergent technologies underscores its pivotal role in digital leadership. This attribute is beneficial and essential for quantity surveying firms, providing them with the agility required to remain pertinent and evolve in tandem with the rapid technological advancements characterising the modern business landscape.

The *Motivational Visionary* trait was discernible through the leadership styles exhibited by the participants. Their focus on cultivating positive relationships and motivating their employees illuminates the critical role of vision in digital leadership. This visionary approach is instrumental in ensuring that teams are not only aligned with but are also committed to the journey of digital transformation, thereby enhancing the potential for successful organisational change.

Innovation, while not explicitly articulated as a distinct characteristic by the participants, was inherently manifest in their leadership methodologies. The innovative spirit of the participants was evident in their strategies for leading their firms towards digitalisation. This trait is exemplified by their encouragement of creativity, openness to new ideas, and proactive adoption of new technologies, all of which are quintessential for fostering an environment conducive to digital progress.

Urgency, the fourth trait, highlighted the imperative need for timely adoption and effective implementation of digital strategies. The participants exhibited a palpable sense of urgency, recognising the necessity for swift and decisive action to ensure the sustained competitiveness and relevance of quantity surveying firms in a rapidly evolving industry.

These identified traits—adaptability, motivational visionary, innovation, and urgency—form the foundation of digital leadership required to drive digital transformation in the quantity surveying field. These characteristics serve as a framework for leaders in this sector, guiding them through the complexities and challenges of the digital era.

Objective 2 of the research intended to determine the criticality of digital leadership in the digital transformation process within quantity surveying firms. The empirical evidence gathered through the study unequivocally establishes digital leadership as a key driver in this transformative journey. The specific characteristics of digital leadership that emerged from the study, namely adaptability, motivation, vision, innovation, and urgency, do not merely contribute to the transformation process but are integral to its success. These traits resonate deeply with the broader tenets of transformational leadership, suggesting a synergistic relationship between effective digital leadership and successful organisational change.

The study's findings highlight the participants' overwhelmingly positive attitudes towards digital technologies and their associated benefits. This perspective, coupled with a proactive stance on adopting and implementing these technologies, emphatically underscores

the indispensable role of digital leadership. It is evident that the leaders within quantity surveying firms who embody these digital leadership traits are pivotal in steering their organisations through the complexities of digital transformation.

In synthesising these findings, it becomes apparent that digital leadership, with its unique blend of adaptability, visionary motivation, innovation, and a sense of urgency, is not merely beneficial but essential for the digital transformation of quantity surveying firms. The emphasis on adaptability and urgency particularly underscores the unique challenges and dynamics prevalent in the quantity surveying industry. These characteristics address the need for firms to adapt rapidly to changing technological landscapes and to do so with a sense of immediacy and foresight.

The research provides substantive insights into digital leadership's critical role in quantity surveying. It clearly indicates that for firms in this sector to navigate the digital landscape effectively, there is a compelling need for leadership that is not only forward-thinking but also agile and responsive to the swift currents of digital change. This narrative guide quantity surveying firms, underlining the importance of cultivating digital leadership capabilities to ensure successful and sustainable digital transformation.

5.2   Recommendations

Based on the research findings, a set of recommendations is proposed to improve the efficacy of digital leadership within quantity surveying firms. These suggestions are inextricably linked to the study's findings, addressing the critical traits of adaptability, motivational visionary leadership, innovation, and urgency.

First and foremost, quantity surveying firms must establish a solid framework that prioritises digital adaptability. In the face of evolving digital technologies, this framework should be designed to instil a culture of continuous learning and flexibility. Firms should organise regular training sessions focused on emerging digital trends relevant to the industry to put this into action. Such an initiative would promote innovation and pioneering project approaches, which is consistent with the study's conclusion that adaptability is a key component of digital leadership.

Second, it is critical to cultivate motivational visionary leadership within these firms. Leaders must be able to articulate and inspire their vision effectively for digital transformation. Leadership development programmes emphasising vision-setting, communication skills, and motivational techniques would be beneficial. According to this recommendation, the motivational visionary trait is critical in aligning and committing teams to the digital transformation journey.

Furthermore, an organisational culture that embraces and encourages innovation is essential. Firms should create environments such as innovation hubs or labs to test new ideas and technologies. Recognising and rewarding innovative practices would strengthen this culture even more. This initiative reflects the conclusion that while not explicitly stated, innovation is inherent in leadership methodologies geared toward digitalisation.

Instilling a sense of urgency in the digital transformation process is also critical. Firms should establish firm deadlines and milestones for digital initiatives, ensuring regular reviews and timely resolution of delays. It is also critical to communicate the importance of timely action in the context of industry evolution and competitive dynamics. This is consistent with the study's conclusion that urgency is necessary for the effective implementation of digital strategies.

Finally, improving the synergy between digital leadership traits and larger organisational change strategies is critical. It is critical to align digital transformation goals with overall business strategy and to incorporate digital leadership traits into leadership recruitment and development processes. This is based on the finding that digital leadership is a key driver in the process of digital transformation within quantity surveying firms.

In essence, these recommendations provide a narrative that guides quantity surveying firms through the complexities of digital transformation. These firms can effectively harness digital technology's potential by cultivating leadership qualities that are not only forward thinking but also adaptable, innovative, and urgent, ensuring successful and sustainable transformation in an ever-changing digital landscape.

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