THE DIGITAL TRANSFORMATION ON BUSINESS MANAGEMENT AND GROWTH OF SANY CONSTRUCTION

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ABSTRACT

This study investigates the role of digital transformation in shaping management strategies and driving business growth in the construction industry, with SANY Construction Malaysia serving as the focal case study. The construction sector, a vital contributor to Malaysia's economy, has been undergoing a paradigm shift under the influence of Industry 4.0 technologies such as Building Information Modeling (BIM), Internet of Things (IoT), AI-powered machinery, and real-time project tracking systems. While these tools promise enhanced productivity, cost efficiency, and sustainability, many firms continue to rely on conventional project management practices, creating a pressing research problem: how can construction companies effectively integrate digital transformation into their management frameworks to achieve long-term growth and competitiveness? To address this, the study employed a qualitative methodology using a single case study design. Data was collected through purposive sampling, involving semi-structured interviews with senior managers, engineers, and other stakeholders at SANY Construction Malaysia, alongside document analysis and field observations. This approach enabled the researcher to gain in-depth insights into organizational processes, leadership strategies, and employee experiences related to digital transformation. The qualitative design was chosen to capture the complexity of human, organizational, and technological interactions within the construction context, offering a nuanced understanding that quantitative surveys might overlook. The findings indicate that SANY's adoption of digital tools has significantly improved operational efficiency, leadership effectiveness, and client engagement. Key themes that emerged include the importance of leadership adaptability, structured employee digital upskilling programs, and financial discipline in implementing new technologies. Furthermore, the study highlights how digital platforms enhanced customer satisfaction and market positioning, enabling SANY to differentiate itself through value creation rather than competing solely on price. Sustainability initiatives, supported by digital monitoring systems, further strengthened the company's reputation as an innovative and responsible player in the industry. The implications of this research are both practical and theoretical. Practically, the study underscores the need for construction firms to invest in digital literacy, foster visionary leadership, and align digital strategies with sustainability goals to remain competitive. Theoretically, it contributes to the understanding of how digital transformation reshapes traditional management paradigms in the construction sector, offering a framework for integrating technology with organizational strategy. Recommendations for future research include conducting comparative multi-case studies across different construction firms in Southeast Asia to explore cross-cultural challenges, adopting longitudinal designs to track digital transformation outcomes over time, and incorporating guest or client feedback data to assess external perceptions of digital-driven service improvements. These directions would extend the knowledge base and offer broader applicability for both scholars and industry practitioners.

Keyword: Digital marketing, digital transformation, construction industry, consumer behavior, sustainability, customer satisfaction, SMEs

APPROVAL

This is to certify that this thesis conforms to acceptable standards of scholarly presentation and is fully adequate, in quality and scope, for the fulfilment of the requirements for the degree of Doctor of Business Administration

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DECLARATION

I hereby declare that the thesis submitted in fulfilment of the DBA degree is my own work and that all contributions from any other persons or sources are properly and duly cited. I further declare that the material has not been submitted either in whole or in part, for a degree at this or any other university. In making this declaration, I understand and acknowledge any breaches in this declaration constitute academic misconduct, which may result in my expulsion from the programme and/or exclusion from the award of the degree.

Name: Chang Bar Kuei

Signature of Candidate: **Date**: 30 September 2025

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LIST OF ABBREVIATION

AI	Artificial Intelligence
ATL	Above The Line
BCP	Business Continuity Planning
BIM	Building Information Modeling
BIM	Building Information Modeling
BTL	Below The Line
CAD	Computer-Aided Design
CIDB	Construction Industry Development Board
CITP	Construction Industry Transformation Programme
ERP	Enterprise Resource Planning
HR	Human Resources
IBS	Industrialized Building System
IBS	Industrialized Building Systems
IoT	Internet of Things
TTL	Through The Line
WMS	Warehouse Management System

CHAPTER 1

INTRODUCTION

1.0 Background of the Study

The construction industry globally is undergoing an accelerated transformation as the Fourth Industrial Revolution (IR 4.0) reshapes traditional processes and management practices. Characterized by digitalization, IR 4.0 introduces advanced technologies such as automation, artificial intelligence (AI), Building Information Modeling (BIM), Internet of Things (IoT), and cloud-based project management platforms. These tools are not only modernizing operational efficiency but also reinventing business models across industries, including construction (Schwab, 2017). Unlike earlier incremental innovations, IR 4.0 represents a systemic shift where data, connectivity, and intelligent systems converge to redefine how construction projects are conceptualized, executed, and monitored. The construction sector, historically reliant on conventional methods that often produce inefficiencies, is now compelled to adopt digital systems that emphasize interconnectivity, real-time data, and enhanced lifecycle management of built assets. A critical aspect of this transformation lies in the ability of firms to generate and utilize digital data across all processes, from design and procurement to execution and post-completion asset management (Lu et al., 2020). BIM, as an essential component of this transition, provides a digital replica of the built environment, enabling collaboration, reducing errors, and streamlining construction delivery.

In Malaysia, the construction industry is a significant contributor to economic growth, employment, and infrastructure development. However, despite its central role, the industry has long grappled with issues of low productivity, rising costs, and

frequent project delays (Construction Industry Development Board Malaysia, 2022). Recognizing these structural inefficiencies, the Malaysian government has prioritized the adoption of Industry 4.0 technologies through frameworks such as Industry4WRD, a national policy promoting digital readiness and transformation across sectors (MITI, 2018). Initiatives like the Construction Industry Transformation Programme (CITP) have also reinforced the need for modernization through Industrialized Building Systems (IBS), sustainability practices, and digital platforms that ensure value creation and competitiveness (Construction Industry Development Board Malaysia, 2022). Within this evolving context, digital technologies are not only enhancing the efficiency of project execution but also transforming business management strategies. By enabling data-driven decision-making, predictive analytics, and streamlined resource allocation, digitalization equips firms to respond more effectively to complex project demands and market pressures (Rahman et al., 2021).

SANY Construction Malaysia represents a compelling case within this broader transformation. Established in 2010, SANY has emerged as a pioneer in the deployment of heavy construction machinery tailored to modern infrastructure needs. Initially, construction equipment was seen as merely functional tools for completing tasks; however, SANY reframed its role by embedding digital technologies that optimize machinery for efficiency, safety, and sustainability (Forbes & Ahmed, 2010). Through this strategic foresight, the company positioned itself at the forefront of construction modernization. By integrating AI-enabled systems, IoT sensors for real-time monitoring, and BIM-based project management tools, SANY not only improved operational performance but also redefined its value proposition. This alignment of advanced technology with business strategy underscores how digital transformation can serve as both an operational and a managerial lever for growth.

Furthermore, SANY's digital integration reflects broader shifts in business management strategies within construction. Traditional hierarchical approaches, reliant on manual oversight and delayed reporting, are being replaced by agile, data-driven management systems. For example, IoT-enabled equipment provides real-time performance updates, enabling managers to make proactive decisions that reduce downtime and optimize resource use. Similarly, BIM platforms foster collaboration across multidisciplinary teams, enhancing transparency and reducing project risks. These technological integrations are further reinforced by the Malaysian government's regulatory push for sustainability and ESG compliance, which compels construction firms to adopt practices that minimize waste, improve energy efficiency, and prioritize safety (MITI, 2018). SANY's strategies not only align with these national policies but also position the company as a leader capable of driving innovation in the Malaysian and regional markets.

Despite the evident opportunities, challenges remain in the industry's digital transition. Issues such as workforce readiness, high initial investment costs, and interoperability of digital platforms often hinder adoption (Lu et al., 2020). However, companies like SANY that embrace proactive digital transformation strategies are better equipped to overcome these barriers and secure long-term competitive advantage. By focusing on leadership adaptability, employee upskilling, and continuous innovation, SANY demonstrates how digital transformation can be harnessed to achieve sustainable business growth. As such, this case offers valuable insights into the interplay between technology, management practices, and organizational performance in the Malaysian construction industry.

In conclusion, the construction industry in Malaysia is at a critical juncture where digital transformation is no longer optional but imperative for growth and

competitiveness. Through the integration of advanced technologies such as BIM, AI, and IoT, firms like SANY Construction are redefining project management, operational efficiency, and strategic innovation. Their journey highlights the broader implications of IR 4.0 for the construction sector: a shift toward interconnected, data-driven, and sustainable business practices that hold the potential to transform industry performance. This study thus positions SANY Construction as an exemplar of how digital transformation can drive both business management excellence and sustained growth within Malaysia's rapidly evolving construction landscape.

Digital Transformation of Management Strategy in Construction Industry

The concept of the construction industry is deeply rooted in understanding how businesses and industries shape infrastructure development and urban growth. This dynamic and evolving industry encompasses a broad spectrum of projects and technologies, each catering to distinct aspects of building and development. While there is no universally agreed-upon definition, scholars and practitioners have recognized the pervasive influence of the construction industry on modern economic growth and societal progress. In this context, the digital transformation of management strategies has become a critical factor in ensuring companies like SANY Construction remain competitive and efficient. This transformation enables construction firms to integrate new technologies, streamline operations, and meet the evolving demands of large-scale infrastructure projects, ultimately reshaping how the industry operates.

According to Oxford Learner's Dictionaries (2023), the construction industry refers to the activities involved in building and assembling infrastructure, including residential, commercial, and industrial projects. This definition highlights the tangible aspects of construction, such as structures and machinery, while also recognizing the

evolving role of technology and digitalization in shaping the modern construction landscape (Ernstsen et al., 2021).

Max Weber, a renowned sociologist, contributed to the understanding of industries by examining their role in delineating social and economic groups. In the context of the construction industry, Weber's ideas can be applied to understanding how advancements like digital transformation reinforce the status and competitive advantage of firms in the sector (Weber, 1948). By embracing digital tools and strategies, companies such as SANY Construction position themselves as leaders in innovation, efficiency, and sustainability, distinguishing them from competitors.

Moreover, David Moore's work on consumer behavior can be adapted to the construction industry, emphasizing the interconnectedness of digital transformation and business strategies. Fitzgerald et al. (2014) concept of a broader "digitalization" can be reframed to reflect how construction companies adopt a comprehensive approach to digitalization—not only integrating technology into individual projects but also embedding it into core management practices to improve overall performance and client satisfaction.

It is important to note that the term "digital transformation" in the construction industry has been subject to multiple interpretations and lacks a singular, universally accepted definition. More than 30 different frameworks for understanding digitalization have been proposed in the literature (Veal, 1991), reflecting its multifaceted nature across sectors like automation, data analytics, and project management. This diversity highlights the wide-ranging applications of digital transformation, including social, economic, and operational aspects within the construction industry.

In the realm of business strategy and industry leadership, digital transformation has gained prominence as a critical tool for improving operational efficiency and achieving competitive advantage (Krishnan, 2011). Construction companies, like SANY Construction, recognize that digitally enhanced management strategies influence project outcomes, from cost savings to faster delivery times. Tailoring operations to incorporate digital tools allows businesses to stay competitive and thrive in an increasingly technology-driven marketplace.

The construction industry in Malaysia, much like other industries globally, has witnessed significant growth and transformation due to the integration of digital technologies. Major cities and infrastructure projects have benefited from this shift, leading to improved project delivery, safety, and overall quality. Digital tools that were once considered niche or specialized are now increasingly adopted by a broader segment of construction firms. SANY Construction has been at the forefront of this transformation, integrating advanced technologies to streamline processes and drive business growth in Malaysia.

In conclusion, the construction industry is characterized by its ability to reflect and shape the built environment, driving economic development and infrastructure growth. It encompasses a wide range of activities, from residential and commercial construction to large-scale infrastructure projects, and plays a pivotal role in modern economies. Understanding the multifaceted nature of the construction industry and the impact of digital transformation of management strategies is essential for businesses operating in this dynamic and competitive sector. Companies like SANY Construction have demonstrated how integrating digital tools and innovative strategies can enhance operational efficiency, drive business growth, and maintain a competitive edge in the evolving construction landscape.

Scope of Business Growth in SANY Construction in Malaysia

Since the inception of SANY Construction, the Researcher has always been a strong proponent of using digital transformation strategies and forward-thinking management principles in steering the company. Over the last few decades, this practice has yielded significant results, as the integration of these strategies has become deeply embedded in the company's leadership and culture. By adopting digital technologies to streamline operations, improve project management, and enhance communication with stakeholders, SANY Construction has built a strong foundation for growth and innovation. These digital transformation strategies have not only enhanced efficiency but have also become an essential part of the company's identity, shaping its competitive edge in the construction industry**.**

Philosophy and Values of SANY Construction Malaysia

Figure 1.1: Philosophy of the Researcher and SANY Construction Malaysia

Figure 1.1 above depicts the key philosophy adopted by the Researcher and the Management Team of SANY Construction. SANY Construction operates in the construction industry, which involves a wide array of stakeholders from both the domestic and international arena. These stakeholders include principals (e.g.: equipment manufacturers, technology providers, construction material suppliers), customers (e.g.: property developers, government infrastructure agencies), and contractors. As different stakeholders have varying considerations, requests, and business perspectives, the Management Team of SANY Construction adopts a Win-Win strategy to balance the needs and expectations of all stakeholders within the business framework. Guided by this philosophy, the team strategically integrates digital transformation of management strategies to enhance efficiency, communication, and collaboration across the board. However, during business negotiations, the Management Team sometimes faces difficult decisions, choosing to forgo certain opportunities when a win-win balance cannot be achieved for all parties involved. This approach ensures sustainable business relationships and long-term success in the competitive construction industry.

There are three core values within the organization which are to be propagated by the staff. These values include:

i. **Execution Excellence** – This concept refers to achieving task efficiency and effectiveness within **SANY Construction**. The organization emphasizes the importance of coaching and mentoring its staff to ensure tasks are completed correctly the first time. This approach not only accelerates project timelines but also contributes to the overall achievement of annual objectives and goals. By leveraging **digital transformation of management strategies**, SANY Construction implements advanced technologies and tools that enhance