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Digital Transformation and Competitive Advantage in the Architectural Creative Economy: A Qualitative Perspective

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Abstract
This study investigates how digital transformation reshapes competitiveness in the creative economy, focusing on the architectural subsector through the Resource-Based View (RBV). Using a qualitative descriptive approach based on a critical review of internationally reputable journal literature, the study synthesises conceptual and empirical insights across three dimensions: the transformation of architectural creative practices, the emergence of digital business models, and strategic pathways for enhancing subsectoral competitiveness. The study makes a theoretical contribution by extending RBV into the architectural creative economy, showing that competitive advantage stems not from digital technology alone, but from the strategic orchestration of creativity, professional expertise, digital literacy, reputation, and knowledge assets into higher-order organisational capabilities. It also contributes to the digital business model literature by demonstrating how digital transformation in the architecture, engineering, and construction ecosystem through BIM-enabled workflows, cloud-based collaboration, and data-driven services such as digital twins shifts value creation from project-based outputs towards standardised, replicable, and knowledge-intensive service offerings. These developments enable service productisation, data-driven advisory models, and recurring value capture mechanisms. Overall, the study highlights RBV as a relevant lens for explaining how architectural firms transform digital resources into scalable differentiation and sustained competitive advantage.
Keywords: creative economy; architectural subsector; digital transformation; resource based view; business model innovation.

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INTRODUCTION

Indonesia has substantial potential to accelerate national economic growth through the strategic development of the creative economy. Creative economy actors account for a significant share of Indonesia's grassroots economic activity and play a central role in sustaining livelihoods across the country. This potential is further reinforced by Indonesia's ongoing demographic dividend, projected to extend until the mid-2030s. By 2030, more than 60 per cent of the population is expected to be of working age, with approximately 27 per cent comprising young people aged between 16 and 30.This sizeable cohort of young Indonesians represents a critical reservoir of entrepreneurial capacity and creative talent, with the potential to drive economic dynamism while simultaneously shaping social and cultural development. These demographic advantages are complemented by the continued existence of numerous regions and localities endowed with abundant resources that remain underutilised. Harnessing creative economic activities within these areas offers a strategic pathway to more inclusive, innovation-led, and regionally balanced economic growth.

The creative industries constitute an ecosystem in which individual ideas are transformed into market-oriented intellectual property, generating innovative goods and services that contribute to both economic prosperity and social well-being. Globally, the creative industries have emerged as a major business sector, driving economic growth and employment creation (Maryunani & Mirzanti, 2015; Chen et al., 2018; Husin et al., 2021). In Indonesia, the systematic development of the creative industries began in 2009 with the issuance of Presidential Instruction No. 6/2009 on the Development of the Creative Economy 2009–2025, initiated by the Ministry of Trade of the Republic of Indonesia. This policy marked a significant institutional commitment to positioning the creative economy as a strategic national priority. Subsequently, in 2015, the government established a dedicated agency—the Creative Economy Agency (Badan Ekonomi Kreatif, BEKRAF) through Presidential Regulation No. 6/2015. BEKRAF assumed responsibility for coordinating, managing, and overseeing the development of the creative economy sector, thereby strengthening governance and policy coherence in this increasingly important domain.

As part of a strategic effort to position the creative industries as a central pillar of Indonesia's economy, the Creative Economy Agency (Badan Ekonomi Kreatif, BEKRAF) introduced the *Indonesia Creative District/City Self-Assessment Programme* (Penilaian Mandiri Kabupaten/Kota Kreatif Indonesia, PMK3I). This initiative aims to map local creative potential and to identify and address structural constraints affecting the development of creative economy systems at the municipal and district levels. The creative economy foregrounds the contribution of creativity, knowledge, and technology as primary sources of economic value creation. Within the architectural sector, professional practice has traditionally concentrated on the production of physical designs and the delivery of project-based professional services. The advent of digital technologies, however, has fundamentally reconfigured architectural processes by enabling digital products and services, facilitating global collaboration, and supporting data-intensive practices throughout the building lifecycle. This transformation situates architecture firmly within the digital creative economy and presents a strategically significant opportunity for developing economies seeking to enhance their creative competitiveness on a global scale.

Within the 2015 Indonesian Standard Industrial Classification (KBLI), the creative economy in the architectural subsector is defined to encompass architectural activities, engineering services, and other related technical consultancy services, as classified under *Other Business Activities* (YBDI), based on data from Statistics Indonesia (BPS). Enterprises operating in this domain are stratified according to their respective subsectors and firm size,

distinguishing between medium–large enterprises (UMB) and micro–small enterprises (UMK). Subsequently, firms are allocated using a power allocation method applied to the auxiliary variable representing the number of enterprises. This approach enables a more proportionate and analytically robust representation of business distribution across subsectors and firm scales within the architectural creative economy.

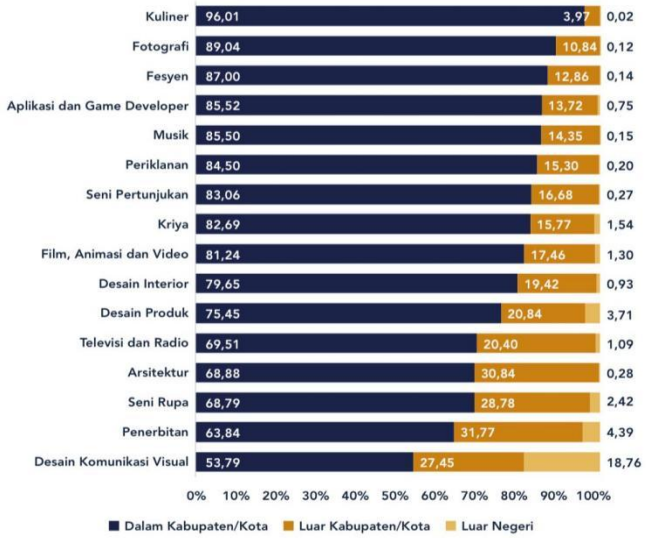

Figure 1. Percentage Distribution of Creative Economy Enterprises by Subsector and Market Coverage, 2020

In line with Indonesia's demographic opportunities and the substantial yet underdeveloped regional potential, the data presented in Figure 1 indicate that creative economy subsectors continue to operate predominantly within local markets. The architectural subsector, in particular, remains heavily reliant on intra-district and municipal markets, accounting for 68.88 per cent of its activity. Market expansion across districts and municipalities represents a further 30.84 per cent, while international engagement remains marginal at only 0.28 per cent. This pattern stands in marked contrast to more digitally tradable subsectors, such as Visual Communication Design, which records 18.76 per cent of sales in international markets, and Publishing, where 4.39 per cent of activity extends beyond national borders. These disparities underscore the strategic importance of digital transformation—through collaborative BIM environments, data-driven consultancy services, and digital products and services deployed across the building lifecycle—as a critical enabler for the architectural subsector to expand its reach across regions and national boundaries. Strengthening such capabilities is essential if architecture is to make a more substantive contribution to the growth of Indonesia's creative economy.

The architectural sector is classified as part of the creative industries because its outputs extend beyond the production of physical buildings to encompass spatial concepts, visual identities, and distinctive, innovative spatial experiences. Indonesia's rich architectural heritage both traditional and modern combined with advances in design technologies, rapid urbanisation, and the growing demand for city branding, has stimulated the emergence of architectural practices and creative actors who position design as a high-value economic commodity. At the same time, this growth has brought significant challenges. These include intensifying price competition in professional services, persistent weaknesses in intellectual property protection, and the need to enhance the capacity of architectural human resources to respond effectively to the evolving dynamics of the creative industries. Addressing these

constraints is critical to sustaining innovation and competitiveness within the architectural subsector.

Architectural services constitute a form of knowledge-intensive business services (KIBS) that have historically relied on close interaction with clients and regulatory authorities. This institutional embeddedness has tended to orient architectural practice towards local and regional markets (Wang, Li, & Zhu, 2016). At the international level, professional services—including architecture also face relatively stringent regulatory and licensing barriers (OECD STRI, 2022), which helps to explain why architectural exports remain modest in comparison with more digitally tradable creative subsectors. Moreover, recent evidence from UNCTAD (2024) indicates that growth in global exports of creative services has been driven primarily by software and digital activities. This trend suggests that deeper digital integration within architectural practice through tools such as BIM, digital twins, energy and life-cycle assessment analytics, and design-for-prefabrication—represents the most viable pathway for extending market reach. Complementing this, a 2022 study on cultural and creative industry ecosystems and Smart Specialisation (S3) highlights the critical role of cross-actor co-creation involving academia, government, and industry in transforming spatial and built assets into creative hubs that stimulate entrepreneurship and generate new markets (Meyer, Gerlitz, & Klein, 2022). From a practice-based perspective, research on innovative architectural firms in Rotterdam further demonstrates how the orchestration of technology-enabled production networks can convert research and design activities into tangible forms of creative economic value (Vriesema & Kloosterman, 2022).

Nevertheless, an important gap remains in the literature. Existing studies on digital transformation have largely focused on technology adoption, process efficiency, and innovation outcomes, while studies on the creative industries have tended to emphasise cultural production, entrepreneurship, and macro-level sectoral contribution. Relatively limited attention has been paid to how digital transformation reshapes capability formation within architectural service firms, particularly how creative, professional, and digital resources are integrated into organisational capabilities that support competitiveness. Similarly, current research has not sufficiently explained how architectural firms capture value from digitalisation beyond project delivery, for example through service productisation, data-driven advisory models, recurring revenue mechanisms, and other forms of business model innovation. As a result, the intersection between digital transformation, capability development, and value capture in architectural services remains conceptually underdeveloped, especially within the context of the creative economy in developing countries such as Indonesia. This study addresses that gap by examining the architectural subsector not merely as a design profession, but as a digitally transforming creative industry in which competitive advantage depends on the formation of strategic capabilities and new mechanisms of value creation, delivery, and capture.

Within this context, the paper addresses three core research questions. First, how has economic activity within the architectural sector evolved over the past five years? Second, in what ways have new creative business models emerged within architectural practice? Third, what strategic measures are required to strengthen an architecture-based creative economy?

THEORITICAL REVIEW

Architectural Theory

The architectural creative industry constitutes a distinctive branch of the creative industries, encompassing activities related to building design, construction planning, construction supervision, and architectural heritage conservation. As a knowledge and design-

intensive sector, architecture produces value that extends beyond the delivery of physical buildings. Within the broader creative economy, the architectural subsector contributes not only to employment creation, but also to environmental quality, urban identity, cultural continuity, and social well-being. In RBV terms, this distinctive position indicates that architectural firms compete not merely through tangible outputs, but through intangible and knowledge-based resources, including design expertise, creative judgement, aesthetic sensibility, professional reputation, and contextual understanding.

Architecture also functions as a communicative and cultural medium through which physical space is shaped to produce innovative, engaging, and meaningful experiences. By structuring spatial form, atmosphere, and user interaction, architectural practice can stimulate imagination and generate new forms of creative value. Contemporary architecture is especially relevant in this regard because it prioritises innovation, adaptability, expressive diversity, and responsiveness to changing social and urban conditions. Rather than representing a fixed stylistic doctrine, contemporary architecture reflects the capacity to reinterpret multiple traditions in light of present needs and emerging possibilities (Hilberseimer, 1964). From an RBV perspective, this interpretive and creative flexibility may be understood as a firm-specific strategic resource, since it enables architectural practices to differentiate their service offerings in ways that are difficult for competitors to imitate.

Schirmbeck (1988) identifies several principles of contemporary architecture, including the innovative use of materials and construction technologies, dynamic formal compositions, open and fluid spatial arrangements, integration of interior and exterior spaces, transparency, intrinsic comfort, and landscape responsiveness.These principles are not only aesthetic or technical characteristics, but also reflect the resource base of architectural firms. The ability to mobilise such principles in practice depends on the possession and deployment of specialised knowledge, design capabilities, and creative routines. In RBV terms, these constitute valuable and difficult-to-replicate resources that, when embedded in organisational processes, can generate distinctive capabilities and enhance competitive positioning.

The development of the creative economy further depends on the effective interaction of key stakeholders, notably academia, government, and business (Daulay, 2018). In architecture, this ecosystemic interaction strengthens access to knowledge, regulation, talent development, and market opportunities. At the firm level, professional competencies such as communication, teamwork, time management, and autonomy have become central, complementing technical expertise with relational and managerial capacities (James Thompson & Pippa Soccio, 2022). These competencies are especially important from an RBV standpoint because competitive advantage does not arise from isolated resources alone, but from the organisational capability to combine technical, creative, and interpersonal assets effectively. Similarly, architectural design competitions function not only as arenas of creative production, but also as mechanisms for capability signalling and reputation building. They allow firms to demonstrate originality, attract clients, and strengthen symbolic capital, thereby contributing to sustained competitive advantage through enhanced visibility and professional legitimacy (Gethin Davison, 2022).

Digital Theory

Digital literacy has become a foundational competence in contemporary academic and professional life. It encompasses the knowledge, skills, and dispositions required to use digital technologies effectively, ethically, and strategically for communication, collaboration, knowledge production, and creative expression. In the context of RBV, digital literacy can be understood as an intangible strategic resource that increases the firm’s ability to absorb,

interpret, and apply technological change. It is not merely an individual skill, but a productive asset that supports knowledge integration, adaptive learning, and innovation.

Amid ongoing digital transformation, a central challenge for economic development lies in integrating local knowledge and cultural resources into inclusive and sustainable forms of digital value creation. Organisations are increasingly shaped by digital technologies that influence structures, workflows, and modes of interaction across sectors (Irhamni Rahman et al., 2024). Within RBV, such developments suggest that competitive advantage depends less on the simple adoption of digital tools than on the firm's ability to transform those tools into organisationally embedded capabilities. In other words, digital technologies are not strategic in themselves; they become strategic when combined with complementary resources such as creativity, expertise, data literacy, organisational learning, and managerial coordination.

Digital transformation is best understood as a multidimensional process involving value creation, structural change, technological adoption, and financial reorientation. It is characterised by broad organisational reach, substantial strategic potential, and rapid change dynamics (Hanel et al., 2021). Organisations pursue digital transformation in anticipation of gains in efficiency, innovation, and competitiveness (Akter & Wamba, 2016). However, from an RBV perspective, these outcomes are contingent upon capability formation. Sustainable advantage emerges only when firms can integrate digital resources into repeatable routines, managerial systems, and service architectures that competitors cannot easily replicate.

Digital Transformation in the AEC Ecosystem

Within the architecture, engineering, and construction (AEC) industry, digital transformation extends beyond the digitisation of administrative tasks. It involves a fundamental reconfiguration of how firms design, collaborate, coordinate, and create value through the integration of technologies such as Building Information Modelling (BIM), artificial intelligence (AI), and digital twins. These technologies improve operational efficiency, support organisational renewal, and strengthen competitive performance (Nyqvist, Peltokorpi, Lavikka, & Ainamo, 2024). Yet in RBV terms, such technologies should be treated as enabling resources rather than sources of advantage per se. Their strategic significance lies in how firms combine them with internal knowledge, design expertise, and governance structures to create higher-order capabilities.

In the architectural subsector, digital transformation shifts practice from static and document-based workflows towards data-driven, collaborative, and iterative environments. It enables firms to work across disciplines and geographies, provide more interactive forms of client engagement, and deliver evidence-based design solutions. This shift has important implications for RBV. It suggests that competitive advantage in architecture increasingly depends on the capability to orchestrate digital resources, creative talent, and professional knowledge into integrated service systems. Such systems allow firms not only to improve efficiency, but also to redefine their value proposition through more scalable, standardised, and knowledge-intensive offerings.

BIM as an Enabler of Digital Transformation and Capability Formation

Building Information Modelling (BIM) is widely recognised as a key enabler of digital transformation because it provides an integrated information environment that supports coordination, consistency, and transparency across project actors. In architectural firms, BIM can strengthen cross-disciplinary collaboration, revision control, design quality, and information continuity throughout the project lifecycle. From an RBV perspective, however, BIM should not be viewed simply as a software tool. Its strategic value depends on whether

the firm can convert BIM adoption into organisational capabilities such as process standardisation, quality assurance, workflow integration, and collaborative governance.
Recent research shows that the benefits of BIM are conditional upon contractual and legal readiness, including clear protocols, explicit role allocation, and robust risk management systems (Alotaibi, 2024). This is significant for RBV because it highlights that capability formation requires complementary organisational arrangements. Firms that develop BIM-related governance routines are better positioned to translate digital resources into sustained advantage, whereas firms that adopt BIM without capability development may achieve only temporary or superficial gains. Likewise, evidence from developing-country contexts suggests that BIM implementation requires stronger process maturity and organisational learning if it is to produce measurable improvements in performance (Rinchen, 2024). This reinforces the RBV argument that sustained competitiveness arises from the orchestration of technology, knowledge, routines, and governance.

Digital Twins and Data-Driven Service Capabilities

Digital twin technologies extend digital transformation beyond design into operation, maintenance, and lifecycle management by enabling real-time modelling, monitoring, and analysis of built assets. A 2024 framework for digital twins in the built environment highlights the importance of human-centred design and strong data governance in their implementation (Osama et al., 2024). In RBV terms, digital twins expand the resource base of architectural firms by introducing new forms of data, analytical knowledge, and service potential. However, these resources generate advantage only when firms possess the capability to interpret data, integrate multiple digital systems, and embed insights into commercially valuable service offerings.

At the AEC ecosystem level, digital twins typically depend on the interoperability of BIM, GIS, and IoT systems, supported by coordinated workflows and standardised data practices (Piras et al., 2024). For architectural firms, this creates opportunities to move beyond conventional project-based services and offer higher-value knowledge-intensive services such as sustainability analytics, performance optimisation, and lifecycle advisory. In RBV terms, this represents a shift from competing through isolated design outputs to competing through dynamic service capabilities. The strategic challenge, therefore, is not only technological adoption, but also the development of integrative capabilities that allow firms to capture economic value from data-driven service innovation.

Business Model Innovation as a Value Capture Mechanism

Digital transformation frequently culminates in business model innovation, understood as changes in how firms create, deliver, and capture value. Empirical evidence shows that digital transformation can stimulate business model renewal by strengthening digital innovation capability and establishing organisational mechanisms for experimentation and learning (Santarsiero, Carlucci, & Schiuma, 2024). Within RBV, business model innovation may be interpreted as the organisational expression of resource orchestration: firms reconfigure their strategic resources and capabilities to create new forms of value capture and competitive differentiation.

In architectural firms, business model innovation may include service productisation, BIM-enabled consultancy, performance-monitoring services, sustainability advisory, subscription-based models, retainer arrangements, and the licensing of digital assets. These developments are especially important because they allow firms to convert digital and creative capabilities into recurring and scalable revenue streams. From an RBV perspective, this

means that sustained competitive advantage in architecture depends not only on possessing valuable resources such as creativity, reputation, or digital knowledge, but also on building capabilities that connect those resources to viable mechanisms of value capture. Without such mechanisms, digital transformation remains limited to internal efficiency gains; with them, it becomes a source of differentiated market positioning and longer-term competitiveness.

Integrative Theoretical Implication

Taken together, architectural theory and digital transformation theory can be integrated within RBV by understanding architectural firms as repositories of strategic resources and capability-building processes. Architectural creativity, design knowledge, professional legitimacy, and cultural sensitivity constitute core intangible resources. Digital literacy, BIM, digital twins, and data infrastructures expand this resource base, but they do not automatically create advantage. Competitive advantage emerges when firms develop organisational capabilities that combine creative and digital resources into coordinated workflows, governance systems, service innovations, and business models. Sustained competitive advantage is therefore achieved when these capabilities enable firms to deliver distinctive, scalable, and difficult-to-imitate value within the architectural creative economy.

Theoretical Synthesis and Conceptual Framework

Drawing on the Resource-Based View (RBV) as the overarching theoretical foundation, this study conceptualises digital technology as an enabling condition rather than a direct source of competitive advantage. Competitive advantage instead emerges from the effective orchestration of valuable, rare, and difficult-to-imitate internal resources into stable organisational capabilities. Within this framework, the conceptual relationships can be summarised as follows: digital transformation activates and necessitates the orchestration of strategic resources such as creativity, professional experience, technological literacy, reputation and networks, and knowledge assets into organisational capabilities. These capabilities include digital workflows, standardised deliverables, collaborative practices, quality assurance and quality control (QA/QC), contract and risk governance, and intellectual property management. As these capabilities mature, they facilitate business model innovation, which in turn enhances the competitiveness of the architectural creative subsector through differentiation, efficiency, quality improvement, market expansion, and strengthened value capture.

Based on this synthesis, the study's conceptual framework is presented in Figure 2 to clarify the relational pathways among the key constructs. The framework also highlights the moderating or enabling role of contextual factors, including regulatory and licensing regimes, ecosystem support structures (pentahelix), and firm scale.

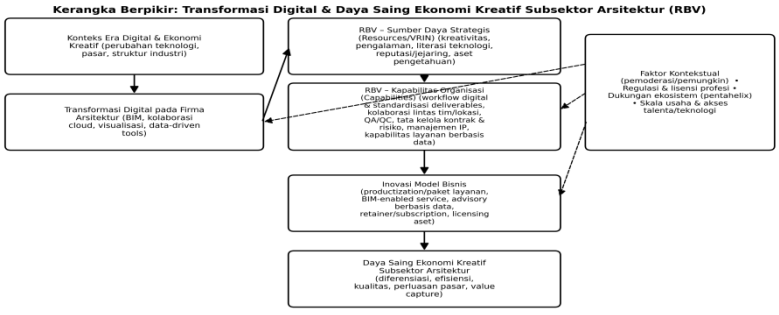

Figure 2. Conceptual Framework: Digital Transformation and the Competitiveness of the Architectural Creative Subsector (Resource-Based View)

Based on the Resource-Based View (RBV), the framework conceptualises digital transformation as a process through which architectural firms convert digital technologies and creative knowledge resources into organisational capabilities that enable business model innovation and ultimately strengthen competitiveness within the architectural creative economy. To clarify how this conceptual model can guide future empirical research, a set of propositions (P1–P7) is formulated to describe the relationships between digital transformation, strategic resources, capability formation, business model innovation, and competitive advantage.

RESEARCH METHODS

This study adopts a qualitative descriptive approach through a library-based critical review. Such a design is appropriate because it enables analytically rich description while remaining closely grounded in the reviewed material and maintaining a relatively low level of inference. It is therefore well suited to examining ideas, practices, and managerial challenges in the architectural subsector of the digital creative economy (Hall & Liebenberg, 2024).

Unlike a purely narrative review, a critical review emphasises evaluative synthesis by assessing the strength of evidence, the consistency of findings, and the conceptual gaps emerging from the literature, together with their policy and managerial implications. To enhance transparency and replicability, the literature was selected through structured searches in Scopus, Web of Science, ScienceDirect, and Google Scholar. The primary review period covered publications from 2015 to 2024, with earlier seminal works included selectively where necessary to support foundational theoretical discussion, especially in relation to architectural theory and the Resource-Based View (RBV). Sources were included if they were peer-reviewed journal articles, scholarly books, or authoritative institutional reports and if they addressed at least one of the following themes: digital transformation, architecture or the AEC sector, creative economy, business model innovation, or capability formation. Sources were excluded if they lacked scholarly credibility, focused only on narrow technical matters without strategic relevance, or did not substantively engage with the study's analytical focus. The review process follows evidence synthesis principles that emphasise explicit search strategies, transparent selection criteria, and justified conclusions (JBI, 2024), while the analysis applies interpretive synthesis to develop thematic insights and build a coherent conceptual framework (Mansilla et al., 2024).

RESULTS AND DISCUSSION

The discussion is structured around the study's research questions, with a focus on how digital transformation reshapes value creation in architectural services, stimulates business model innovation, and necessitates the strengthening of resources and capabilities aligned with the Resource-Based View (RBV)—to enable sustainable competitive advantage.

First, the architectural creative subsector has been increasingly shaped by digitalisation over the past five years, which has fundamentally altered how creative services are produced, delivered, and traded. According to UNCTAD, digitalisation—particularly the adoption of artificial intelligence—has emerged as a primary driver of growth in the creative economy. This trend also brings challenges, such as market concentration and intellectual property concerns, which are especially relevant in architecture as a knowledge-based service

where value is increasingly defined by the ability to manage design knowledge, foster collaboration, and enhance client experiences through digital media (UNCTAD, 2024).

Second, digital transformation within the architecture, engineering, and construction (AEC) ecosystem has made Building Information Modelling (BIM) a core infrastructure for collaboration and standardisation of project deliverables. A recent 2024 review focused on developing country contexts shows that successful BIM adoption goes beyond technical issues and requires tailored organisational strategies, policy frameworks, and readiness for process changes (Rinchen, Banihashemi, & Alkilani, 2024). Architectural firms that excel do not simply use BIM software but leverage it to reconfigure workflows, redefine professional roles, and establish quality control mechanisms that enable effective coordination across stakeholders.

Third, governance emerges as a crucial aspect of digital transformation. A 2024 study highlights that BIM's collaborative and project management benefits must be complemented by robust legal and contractual frameworks. These should include BIM protocols, clear dispute resolution mechanisms, and heightened legal literacy to address issues such as scope creep, model ownership, data exchange, and intellectual property protection (Alotaibi et al., 2024). For architectural firms, digital transformation must be seen as a socio-technical process, requiring the renewal of governance structures, rather than simply the adoption of advanced tools.

Fourth, when viewed through the lens of RBV, digital transformation underscores the strategic importance of integrating internal resources—such as creativity, professional experience, digital literacy, reputation, and networks—into coherent organisational capabilities. These capabilities include the standardisation of digital workflows, cross-location collaboration, change management, and the governance of contracts and intellectual property. Such capabilities are difficult to imitate and form the foundation of sustainable competitive advantage by ensuring service reliability and maintaining the aesthetic and functional quality at the core of architectural services.

Fifth, business model innovation plays a critical role in mediating the relationship between digital capabilities and competitive advantage. Evidence from 2024 indicates that digital transformation catalyses business model innovation through organisational mechanisms such as innovation laboratories, which enhance digital innovation capacity and facilitate business model renewal (Santarsiero, Carlucci, & Schiuma, 2024). In architecture, business model innovation may include service productisation—via standardised service packages, BIM-enabled services supporting cross-disciplinary coordination and change management, and data-driven advisory services focusing on performance and sustainability. These approaches are often supplemented by retainer- or subscription-based revenue models for post-project services. Together, these models diversify revenue streams, increase client switching costs, and thereby strengthen competitive positioning. The mediation of business model innovation is essential in translating digital capabilities into sustained competitive advantage by ensuring that firms capture more value from digital transformation than just efficiency gains.

Sixth, strategies to strengthen the architectural subsector within the digital creative economy can be articulated across three interrelated levels. At the individual level, emphasis should be placed on digital literacy and collaborative project-based skills to translate creative potential into effective digital workflows. At the organisational level, capacity building in process standardisation, quality assurance, governance of contracts and intellectual property, and organisational learning is critical to ensure that technology adoption leads to enduring capabilities rather than isolated technical usage. At the ecosystem level, coordinated support

from government, business, academia, communities, and media is essential to strengthen standards, incentives, and market access, addressing governance challenges identified by UNCTAD (2024) and sustaining competitiveness at scale.

CONCLUSION

Indonesia's creative industries have benefited from a strong institutional foundation since the issuance of Presidential Instruction No. 6/2009 on the Development of the Creative Economy 2009–2025, further reinforced by the establishment of the Creative Economy Agency (Badan Ekonomi Kreatif, BEKRAF) in 2015. Through initiatives such as the Indonesia Creative District/City Self-Assessment Programme (Penilaian Mandiri Kabupaten/Kota Kreatif Indonesia, PMK3I), the government has sought to map regional creative potential and strengthen local creative economy ecosystems. Within this policy framework, the architectural subsector occupies a strategically important position. As a component of knowledge-intensive business services (KIBS), architectural services extend beyond the production of building designs to the creation of spaces that enable social creativity and innovation.

However, despite these strengths, empirical evidence indicates that the architectural subsector remains heavily reliant on local markets and exhibits relatively low export penetration when compared with more digitally-oriented creative subsectors. For small and medium-sized architectural firms (SMEs) seeking to scale and expand their market reach, this local market reliance poses both a challenge and an opportunity. The advancement of digital technologies provides new pathways for these firms to transcend local boundaries, particularly through the adoption of Building Information Modelling (BIM), data-driven design processes, online collaboration, and the development of digital architectural products and services. These digital strategies allow SMEs to extend their reach from local markets to national and global contexts, thus opening new avenues for growth.

Moreover, the application of contemporary architectural approaches, characterised by expressive form-making, material innovation, spatial openness, and landscape integration, reinforces architecture's role as a creative medium. For SMEs, this presents a strategic opportunity to differentiate their offerings by focusing on innovative design solutions that combine cutting-edge technology with creative expression. By leveraging these opportunities, small and medium firms can transition from providing traditional, project-based services to offering more scalable, productised services such as digital design packages, data-driven a dvisory services, and subscription-based post-project services.

Managerial Implications for Small and Medium Architectural Firms

1. Embrace Digital Transformation as a Growth Strategy
   For small and medium-sized firms, the adoption of digital tools such as BIM, cloud-based collaboration platforms, and data analytics is crucial not only for improving operational efficiency but also for expanding market reach. By investing in digital technologies, SMEs can create digital products and services that are easily replicable and scalable, allowing them to move beyond the limitations of local markets. This transformation also enables SMEs to offer more flexible and customisable service packages, potentially reaching clients at a national or even international level.
2. Productise Services for Recurring Revenue
   SMEs in architecture can benefit from business model innovation by transitioning from project-based, one-off service offerings to productised services that generate recurring revenue streams. For instance, developing standardised digital design packages or data-driven advisory services on topics like energy efficiency, sustainability, or lifecycle

management allows firms to scale their offerings across multiple clients without the need for significant resource expansion. This approach can also help SMEs attract larger clients, secure long-term contracts, and build more sustainable business models.

3. Strengthen Human Capital for Digital Competence
   To succeed in the digital era, SMEs must invest in building a workforce that is both digitally literate and highly collaborative. This includes equipping employees with technical skills related to digital tools and technologies (e.g., BIM, CAD, data analytics), as well as soft skills in communication, teamwork, and project management. By prioritising the development of both hard and soft skills, architectural firms can improve workflow efficiency, foster better client relationships, and create a culture of innovation that drives sustainable growth.
4. Build Strategic Alliances and Collaborations
   Effective collaboration among pentahelix actors (government, business, academia, communities, and media) is essential for SMEs to build a thriving, sustainable ecosystem. Architectural firms should proactively engage with these actors to access resources, co-create innovative solutions, and enhance their visibility. Collaboration with universities, for example, can provide access to cutting-edge research and innovative design methodologies, while partnerships with governmental bodies can open doors to new market opportunities and policy incentives. By engaging in these collaborative efforts, SMEs can amplify their capabilities and increase their competitiveness in the digital creative economy.
5. Target International Markets with Digital Solutions
   Expanding into international markets can be daunting for SMEs, but digitalisation provides a manageable and cost-effective pathway. Through the development of BIM-enabled services, performance monitoring tools, and data-driven sustainability advisory offerings, architectural firms can position themselves as global players in the creative economy. In particular, digital tools that allow for remote collaboration and virtual project management enable SMEs to work with international clients without the need for physical presence, lowering operational costs and increasing market access.
6. Standardisation and Quality Assurance
   To scale effectively, SMEs must adopt consistent standards for their digital workflows, quality assurance (QA), and service delivery. This ensures that the quality of their work remains high, even as they expand. Standardisation also facilitates the replication of services across multiple clients, improving efficiency and reducing costs. Implementing robust QA and control systems ensures that digital products and services maintain their value and integrity across different projects and markets, fostering trust with clients and partners.
7. Reduce Regulatory Barriers and Expand Market Access
   Finally, the expansion of market access particularly across regional and international borders requires targeted efforts to reduce regulatory barriers. SMEs in architecture should advocate for policy reforms that simplify regulatory requirements for digital services and cross-border collaborations. By addressing these challenges and promoting regulatory frameworks that support digital transformation, SMEs can more easily expand their services to a global market, tapping into new revenue streams and diversifying their client base.

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