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Enterprise Architecture and Business Model Innovation: Digital Platform Strategies for Scalable Architecture Practice

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Abstract *– The Philippine construction market reached USD 39.40 billion in 2024, with projections indicating substantial growth to USD 60.08 billion by 2033, representing a compound annual growth rate (CAGR) of 4.80% (IMARC Group, 2024). This growth is primarily fueled by accelerated urbanization, increasing foreign direct investments, and large-scale government-funded initiatives, particularly the Marcos administration's $165 billion Build Better More (BBM) program encompassing 207 flagship infrastructure projects (National Economic and Development Authority [NEDA], 2023). Despite these unprecedented opportunities, the Philippine architecture industry faces a critical juncture characterized by structural constraints that prevent local firms from fully capitalizing on this market expansion. Local architecture firms remain constrained by traditional United Architects of the Philippines (UAP) fee-for-service frameworks charging 6-12% of construction costs, creating cyclical revenue patterns that inhibit strategic investment in technology and talent development. Industry fragmentation and reliance on outdated operational and financial models prevent firms from participating effectively in large-scale infrastructure projects and building sustainable, scalable businesses. Survey data from 120 Philippine Contractors Accreditation Board (PCAB)-registered architecture firms reveal that 67.5% have fewer than 30 employees, 50% allocate less than 5% of revenue to technology investment, and only 38.3% have adopted Building Information Modeling (BIM) despite its widespread global use. Furthermore, 61.7% of firms cite high implementation costs as the primary barrier to technology adoption, while 37.5% report no business model changes despite available digital technologies. This research examines how Philippine architecture firms can transition from traditional project-based models to platform-based business models that leverage enterprise architecture frameworks, digital technologies, and dynamic capabilities to achieve sustainable scalability and competitive advantage in domestic and regional markets. The study integrates Dynamic Capabilities Theory, Platform Ecosystem Theory, and Enterprise Architecture Framework Theory (TOGAF) to develop a comprehensive Digital Platform Transformation Framework. This framework provides systematic guidance for firms to develop sensing, seizing, and reconfiguring capabilities; design scalable platform architectures; and implement structured transformation processes that align business strategy with technology implementation, ultimately enabling participation in large-scale government projects and expansion into high-growth ASEAN construction markets.*

Keywords *– enterprise architecture, business model innovation, platform business models, Philippine construction industry, TOGAF Framework*

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INTRODUCTION

The global construction industry is undergoing profound transformation driven by digital technologies, evolving business models, and increasing demands for sustainable and efficient building practices. Within this context, the Philippine construction sector presents a compelling case study of both opportunity and constraint. While the market demonstrates robust growth trajectories and unprecedented government investment through initiatives like the Build Better More program, local architecture firms remain structurally limited in their ability to capture value from this expansion (IMARC Group, 2024; NEDA, 2023).

Philippine architecture firms face fundamental constraints in scaling beyond traditional project-based models, limiting their ability to capitalize on the expanding domestic construction market valued at ₱2.1 trillion (USD 37.5 billion) with projected growth to USD 131.41 billion by 2033 (Mordor Intelligence, 2025). Local firms remain constrained by conventional United Architects of the Philippines (UAP) fee-for-service frameworks charging 6-12% of construction costs, while lacking access to venture capital and digital transformation investments available to international competitors (UAP, 2024).

Despite the Philippines' USD 38 billion IT-BPO sector and advanced digital infrastructure (IT and Business Process Association of the Philippines [IBPAP], 2024), architecture firms have failed to leverage this technological ecosystem for scalable business platforms. The industry remains highly fragmented, with firms competing primarily on price rather than value-added services, operating under regulatory frameworks that have not evolved to accommodate innovative business models (Republic of the Philippines, 2004). While government infrastructure programs like Build Better More (USD 176.7 billion in 207 flagship projects) and ASEAN regional expansion opportunities exist, local firms lack enterprise architecture frameworks and digital platform capabilities necessary for large-scale project participation and recurring revenue development (NEDA, 2023).

This research examines how Philippine architecture firms can transition from traditional fee-for-service models to platform-based business models that leverage enterprise architecture frameworks, digital technologies, and dynamic capabilities to achieve sustainable scalability and competitive advantage in both domestic and regional markets.

Statement of the Problem

Philippine architecture firms face systemic constraints that prevent them from scaling beyond traditional project-based models, limiting their ability to capture opportunities in the growing construction market. The industry operates within rigid regulatory and financial frameworks that restrict innovation and investment, while missing the chance to leverage the country's advanced digital infrastructure and IT-BPO ecosystem for scalable, technology-driven growth. Persistent price-based competition erodes value creation and discourages diversification into higher-value services, leaving firms dependent on cyclical revenue streams. Furthermore, the absence of enterprise architecture and platform capabilities undermines strategic alignment, digital transformation, and collaboration on large-scale projects, keeping local firms at a competitive disadvantage in both domestic and regional markets.

LITERATURE REVIEWS

Enterprise Architecture and Digital Transformation

Enterprise architecture serves as a strategic foundation for digital transformation by providing structured frameworks that align business objectives with technology implementation (The Open Group, 2018). Enterprise architecture encompasses four primary layers: business architecture (strategy, governance, operating model), application architecture (software systems and interactions), data architecture (information structure and flow), and technology architecture

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(infrastructure, networks, cloud platforms).

The Open Group Architecture Framework (TOGAF) represents the most widely adopted enterprise architecture methodology due to its structured Architecture Development Method (ADM) (The Open Group, 2018). TOGAF's ADM provides a step-by-step process consisting of eight phases plus continuous requirements management. Research demonstrates that enterprise architecture reduces uncertainty and accelerates transformation by improving collaboration between business and IT functions, streamlining the technology landscape, and establishing clear governance processes.

Platform Business Models and Network Effects

Platform business models represent a fundamental shift from linear to ecosystem-based value creation, enabling value through exchanges among participants rather than sequential activities (Parker et al., 2016). These models leverage scalability by serving more users at minimal incremental cost, promote connectivity among diverse stakeholders to reduce transaction costs and facilitate collaboration, and promote generativity, allowing third parties to build complementary innovations on the platform (Parker et al., 2016). The economic driver is network effects, where platform value grows with increased participation, leading to positive feedback and potential winner-take-all market outcomes (Kenney & Zysman, 2016).

Business Model Innovation and Dynamic Capabilities

Business model innovation involves reconfiguring how firms create, deliver, and capture value (Teece, 2018). Dynamic capabilities theory provides a framework for understanding how firms successfully innovate business models in changing environments. Teece (2007) defines dynamic capabilities as "a firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (p. 1319).

Digital Technologies in Architecture and Construction

Digital technologies are fundamentally transforming architecture and construction practices, enabling new forms of value creation and service delivery.

Building Information Modeling (BIM)

Building Information Modeling represents a paradigm shift from traditional 2D documentation to intelligent 3D modeling integrated with project data (Autodesk, 2024; Chan et al., 2019). BIM provides multiple benefits including enhanced collaboration, improved design accuracy, cost and time savings, and lifecycle management capabilities. Research demonstrates that BIM-based clash detection can lead to cost savings of 20% of contract value (Chan et al., 2019).

Digital Twin Technology

Digital twins extend BIM capabilities by creating live, virtual representations of physical assets that integrate real-time data from sensors, IoT devices, and building management systems (SGS, 2023; Su et al., 2024). The global digital twin market was valued at USD 24.97 billion in 2024 and is projected to reach USD 155.84 billion by 2030, demonstrating significant commercial opportunities (Grand View Research, 2024).

Digital twins provide capabilities including real-time monitoring, predictive analytics, performance optimization, and enhanced decision-making. By analyzing real-time data, digital twins predict when equipment and structures might fail, enabling proactive maintenance before problems occur (Attaran & Celik, 2023).

ASEAN Construction Market Opportunities

The ASEAN construction market presents significant expansion opportunities for Philippine architecture firms, driven by urbanization, infrastructure investment, and economic growth across Southeast Asia.

Key market characteristics include infrastructure investment in transportation networks, energy systems,

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and sustainable building solutions; smart cities development incorporating digital technologies; and increasing sustainability emphasis for energy-efficient buildings.

Philippine architecture firms can leverage several advantages in ASEAN markets: cultural and geographic proximity, digital infrastructure capabilities, cost competitiveness, and English proficiency facilitating communication with international clients and consultants.

Research Questions

This research addresses four fundamental questions:

1. How do traditional fee-for-service frameworks and regulatory constraints hinder the scalability of Philippine architecture firms compared to international competitors?
2. In what ways can Philippine architecture firms leverage the country's advanced IT-BPO sector and digital infrastructure to develop scalable and technology-driven business models?
1. What strategies can local firms adopt to shift competition from price-based to value-added services within the expanding domestic and ASEAN construction markets?
2. How can enterprise architecture frameworks and digital platforms enable Philippine firms to participate in large-scale government infrastructure projects and create recurring revenue streams?

Theoretical Framework

This research synthesizes three core theoretical frameworks—Dynamic Capabilities Theory, Platform Ecosystem Theory, and Enterprise Architecture Framework Theory—to guide Philippine architecture firms in transitioning from traditional service models toward scalable, platform-based business models. Dynamic Capabilities Theory clarifies how firms can sense, seize, and reconfigure resources to innovate in dynamic environments; Platform Ecosystem Theory identifies what architectures leverage network effects and scalability for sustainable competitive advantage; and Enterprise Architecture Framework Theory outlines the systematic process for transformation through structured methodologies such as TOGAF. Together, these integrated frameworks offer comprehensive guidance for building capabilities, selecting effective business models, and implementing strategic transformation in the architectural sector.

OBJECTIVES OF THE STUDY

The objective of this study is to assess barriers that limit Philippine architecture firms' scalability and identify strategic approaches for transitioning to platform-based, value-driven models. The general objective is to analyze regulatory, financial, and technological challenges while proposing frameworks for leveraging digital transformation and business model innovation. Specific objectives include:

1. To analyze how traditional fee-for-service frameworks and regulatory constraints impact the scalability of Philippine architecture firms in comparison with international competitors.
2. To explore opportunities for Philippine architecture firms to utilize the country's IT- BPO sector and digital infrastructure in building scalable and technology-driven business models.
3. To identify strategies that enable Philippine architecture firms to transition from competing primarily on price to delivering value-added services in the domestic and ASEAN construction markets.
4. To examine how enterprise architecture frameworks and digital platforms can support local firms in participating in large-scale government infrastructure projects and developing recurring revenue streams.

MATERIALS AND METHODS

This study employed a mixed-methods research design combining quantitative survey data with qualitative framework development. The quantitative component consisted of an online survey of 120

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Philippine architecture firms registered with the Philippine Contractors Accreditation Board (PCAB), achieving a 100% response rate. The qualitative component involved the development of a comprehensive transformation framework integrating enterprise architecture, dynamic capabilities, and platform business model theories.

Data Collection

The online survey focused on technological adoption, business model structures, and strategic growth barriers among Philippine architecture firms. The survey consisted of 14 questions organized into five sections: (1) Firm Profile, (2) Technological Adoption,
(3) Business Model Structures, (4) Strategic Growth Barriers, and (5) Future Outlook.

RESULTS AND DISCUSSION

Findings from the Online Survey related to the Research Questions

RQ1. How do traditional fee-for-service frameworks and regulatory constraints hinder the scalability of Philippine architecture firms compared to international competitors?

RQ1.1 Fee-for-Service Revenue Model Constraint Analysis. Shows the gap between tech investment allocation and actual BM innovation due to regulatory barriers

Table 1. Model Change by Revenue and Policy

Tech Revenue %	Business Model Change	Government Policy Influence		
		Min	Mod	Str
11-20%	Moderately Changed	1	0	0
	No Change	4	2	2
	Significantly Changed	0	0	1
	Slightly Changed	1	1	1
5-10%	Moderately Changed	4	6	5
	No Change	4	6	0
	Significantly Changed	1	2	1
	Slightly Changed	5	2	1
<5%	Moderately Changed	3	4	4
	No Change	11	6	6
	Significantly Changed	1	2	2
	Slightly Changed	2	9	3
>20%	Moderately Changed	1	0	1
	No Change	0	0	1
	Slightly Changed	0	0	1

Table 1 summarizes a Chi-Square test assessing the relationship between Tech Revenue Percentage, Business Model Change, and Government Policy Influence. The test statistic was $\chi^2=27.26$ (28 degrees of freedom) with a p-value of 0.5039, below the critical value of 41.34 at $\alpha=0.05$. As a result, the null hypothesis of independence could not be rejected, confirming no significant association among these three variables.

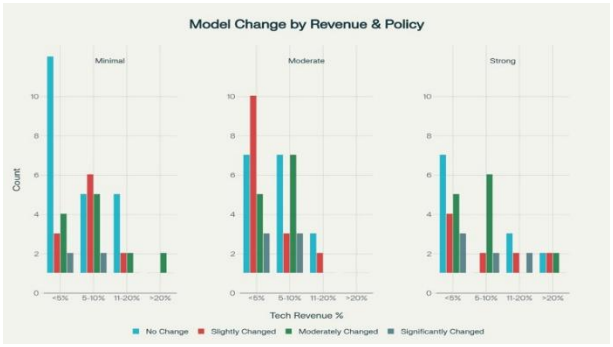

Figure 1. *Model Change by Revenue & Policy*

Figure 1 shows the relationship between technology revenue percentage allocation, level of business model change, and government policy influence.

These findings indicate that there is no statistically significant association among Tech Revenue Percentage, Business Model Change, and Government Policy Influence. Consequently, the observed variations in the data are likely attributable to random fluctuations rather than systemic relationships among the variables.

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RQ1.2: Regulatory Framework Impact on Business Structure Scaling. Show how RA 9266 constraints prevent business structure evolution and BM innovation.

Table 2. Business Model Change by Structure

Business Structure	Business Model Change	Policy Influence		
		Min	Mod	Str
Cooperative	Moderately Changed	1	0	2
	No Change	0	2	1
	Significantly Changed	0	0	1
	Slightly Changed	0	1	0
Corporation	Moderately Changed	4	5	6
	No Change	9	6	4
	Significantly Changed	2	1	3
	Slightly Changed	2	4	2
Partnership	Moderately Changed	3	3	0
	No Change	6	3	1
	Significantly Changed	0	2	0
	Slightly Changed	4	5	4
Sole Proprietorship	Moderately Changed	1	2	2
	No Change	4	3	3
	Significantly Changed	0	1	0
	Slightly Changed	2	2	0

Table 2 examines the impact of RA 9266 regulatory constraints on business model innovation using chi- square tests and finds that regulatory environment, business structure, and business model change are statistically independent of each other.

- Chi-Square Test 1: Business structure does not predict the likelihood or type of business model adaptations (χ^2=9.33, p=0.41, Cramér's V=0.17).
- Chi-Square Test 2: Regulatory influence is uniform across business structures, with no significant link between structure and exposure (χ^2=5.24, p=0.51, Cramér's V=0.16).
- Chi-Square Test 3: Organizations exposed to more regulation are not more likely to pursue significant business model changes (χ^2=4.78, p=0.57, Cramér's V=0.15).

In summary, Table 2 shows that structural type, regulatory exposure, and innovation strategies operate independently; organizations adapt business models due to market, technological, or strategic factors, not in response to regulatory pressures or structural form.

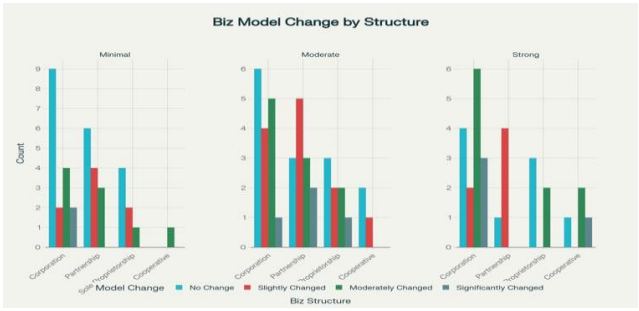

Figure 2. *Business Model Change by Structure*

Figure 2 shows cost and client demand barriers by business structure and firm size.

RQ1.3 Barrier Prevalence by Business Model Type Comparison. Compare the scalability constraints of Philippine fee-for-service vs. alternative model firms and identify which Philippine firm types face most severe fee-for-service scalability constraints.

Table 3. Barrier Prevalence by Structure

Business Structure	Firm Size	Client Demand	High Cost
Cooperative	1-10	1	1
	11-30	0	1
	31-50	2	2
Corporation	1-10	8	14
	11-30	6	10
	31-50	1	7
	51-100	2	3
	100+	1	2
Partnership	1-10	7	12
	11-30	1	7
	31-50	1	2
	51-100	0	2
	100+	0	1
Sole Proprietorship	1-10	3	2

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	11-30	3	3
	31-50	0	3
	51-100	2	1
	100+	1	1

Table 3 shows that high-cost barriers are the main constraint for architectural firm growth, affecting 52-78% across all firm types, making financial challenges the biggest obstacle to scaling. At the mid-size threshold (31-50 employees), high- cost barriers peak at 77.78%, while client demand issues drop to 22.22%, indicating a tough transition zone that demands strategic financial planning. Partnerships bear the heaviest financial burden (72.73% High-Cost), while Sole Proprietorships display the most balanced mix (47.37% Client Demand vs. 52.63% High-Cost), highlighting a trade-off between market positioning and financial efficiency. Statistical tests confirm that barrier types are independent of firm structure, meaning effective solutions must be industry-wide, such as targeted lending, tax incentives, or specialized financial tools. Overall, persistent high-cost barriers demonstrate that scaling is more restricted by capital than market factors, informing policy, financing, and planning approaches for architecture firms.

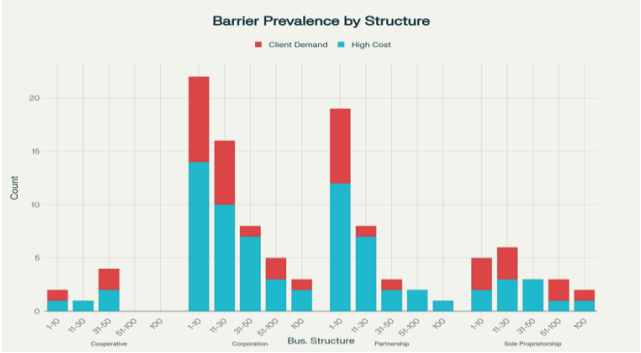

Figure 3. *Barrier Prevalence by Structure*

Figure 3 shows cost and client demand barriers by business structure and firm size in architectural firms. Chi-square tests found no statistically significant associations: Barrier Type × Business Structure (χ^2=2.404, p=0.493, Cramér's V=0.146), Barrier Type × Firm Size (χ^2=1.956, p=0.744, Cramér's V=0.132), and Business Structure × Firm Size (χ^2=16.178, p=0.183, Cramér's V=0.219). Barrier prevalence is independent of business model or scale, with "High Cost" ranging 52.63% to 77.78% and "Client Demand" 22.22% to 47.37%. This means financial and market barriers are professional-wide and not linked to how firms are organized or their size, indicating comparable constraints across all firm types and structures.

RQ1.4: Revenue Adequacy vs. Growth Aspiration Gap. Compare the Fee-for-service framework with alternative revenue models and growth potential and show firms aspiring to growth but trapped by the fee-for-service revenue model's inadequacy.

Table 4. Revenue Adequacy vs. Growth Aspiration Gap - Current Tech Revenue vs. Future Investment Intent by Growth Barriers

Tech Revenue %	Future Investment	Competition	Economic Instability	Limited Financing	Regulatory Limitations	Skill Shortage
<5%	Very Likely	0	1	5	1	1
	Likely	6	8	5	5	2
	Neutral	7	6	1	2	0
	Unlikely	2	2	2	0	0
	Very Unlikely	1	0	3	0	0

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5-10%	Very Likely	0	1	1	1	0
	Likely	3	1	2	4	0
	Neutral	6	2	2	3	2
	Unlikely	1	1	0	3	0
	Very Unlikely	3	1	3	1	0
11-20%	Very Likely	0	1	0	1	1
	Likely	2	1	1	2	0
	Neutral	2	1	0	0	0
	Unlikely	1	0	0	1	0
>20%	Likely	1	0	0	0	0
	Neutral	1	0	0	0	0
	Unlikely	1	0	1	0	0
	Very Unlikely		0	1	0	0

Table 4 reveals that most architectural firms (55%, n=66) face a "high gap" low technology revenue (75.76% earn <5% from tech services) but strong intentions to boost digital investment (75.76% likely or very likely to invest). These growth-aspirational firms are primarily constrained by economic instability (27.27%), competition (24.24%), and regulatory/financial barriers (21.21%). By contrast, only 11.67% of firms (n=14) show a "negative gap" with higher tech revenue (57.14% earn 5–10%, 28.57% >20%) but low investment intention (92.86% unlikely to invest), mainly due to market saturation or satisfaction, facing similar competitive and financial barriers. Moderate gap (22.5%) and revenue-aspiration alignment (10.83%) represent transitional/stable groups. Statistical tests indicate barrier profiles do not differentiate gap types (χ^2=6.37, p=0.896), showing that growth ambitions and perceived barriers operate independently. This points to a market with widespread ambitions but limited investment reality, shaped by capital limits, risk aversion, or capability gaps—meaning many digital opportunities remain unrealized despite stated intentions.

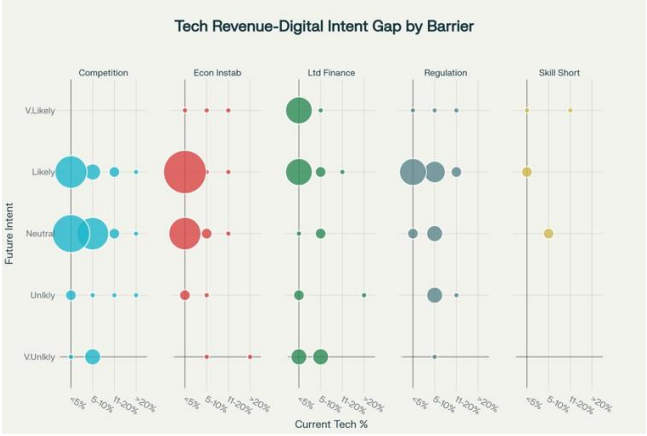

Figure 4. *Tech Revenue-Digital Intent Gap by Barrier*

Revenue Adequacy vs. Growth Aspiration Gap - Current Tech Revenue vs. Future Investment Intent by Growth Barriers

RQ2. In what ways can Philippine architecture firms leverage the country's advanced IT-BPO sector and digital infrastructure to develop scalable and technology-driven business models?

RQ2.1: Technology Adoption Portfolio Index & IT-BPO Readiness. It explores IT-BPO utilization for cloud

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platforms, BIM, digital twin, AI-aided design tools, and measures overall technology portfolio sophistication, enabling IT-BPO ecosystem integration

Table 5. Technology Adoption Portfolio Index & IT- BPO Readiness - Tech Score Distribution and Business Model Outcomes by Firm Size

Tech Score	Firm Size	No Change	Slightly Changed	Moderately Changed	Significantly Changed
0	1-10	0	0	0	1
	100	1	0	0	0
	11-30	1	2	0	0
	31-50	0	0	1	0
	51-100	0	0	1	0
1	1-10	5	7	4	1
	100	0	1	0	0
	11-30	7	0	5	2
	31-50	2	2	2	1
	51-100	2	2	1	1
2	1-10	13	5	2	3
	100	1	0	1	0
	11-30	2	2	4	0
	31-50	2	3	4	0
	51-100	4	0	0	0
3	1-10	3	3	1	0
	11-30	1	0	4	1
	31-50	3	0	1	0
	51-100	0	0	1	0
1	1-10	5	7	4	1
	100	0	1	0	0
	11-30	7	0	5	2

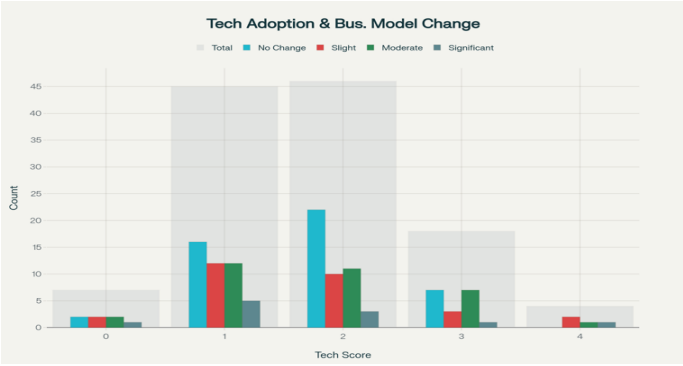

Figure 5. *Technology Adoption & Business Model Change*

Table 5 and Figure 5 show that across 120 architectural firms, technology and IT/BPO adoption is generally low to moderate, with an average score of 1.73 out of 4, concentrated in Minimal (37.5%) and Moderate (38.3%) categories. Only 18.33% of firms reach advanced readiness (scores 3–4), while 5.83% remain at zero readiness. Adoption is statistically independent from both business model change (χ^2=7.78, p=0.802) and firm size (χ^2=15.29, p=0.503), with no meaningful differences found—larger firms average 2.00; micro firms 1.63. This demonstrates that IT/BPO readiness

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arises from individual firm characteristics—such as sector focus, client requirements, or leadership—not because of business strategy or growth. Achieving advanced technology capabilities requires specific, strategic investment, beyond organizational scaling or business model adaptation.

RQ2.2: Cloud-Based Collaboration Platform Adoption & Business Model Impact. It investigates cloud-based collaboration platforms and BIM integration for competitive advantage and shows platform/AI adoption effectiveness in driving BM innovation by firm maturity.

Table 6. Data on Cloud/AI combinations and business model outcomes by firm age cohort.

Cloud Tools	AI Automation	Business Model Change	<5 Years	5-10 Years	11-20 Years	>20 Years
No	No	Moderately Changed	3	3	6	2
		No Change	2	10	4	4
		Significantly Changed	0	3	1	1
		Slightly Changed	2	3	4	2
	Yes	Moderately Changed	0	1	2	2
		No Change	0	3	1	1
		Significantly Changed	0	1	0	0
		Slightly Changed	3	0	1	1
Yes	No	Moderately Changed	2	2	4	3
		No Change	2	6	7	4
		Significantly Changed	1	1	1	0
		Slightly Changed	1	2	4	1
Yes	Yes	Moderately Changed	1	0	1	1
		No Change	1	1	1	0
		Significantly Changed	0	0	0	2
		Slightly Changed	0	0	4	1

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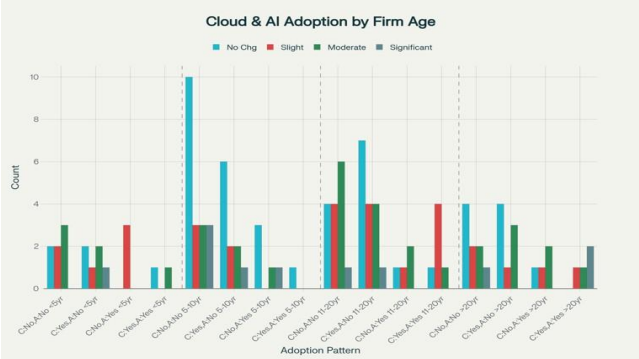

Figure 6. *Cloud & AI Adoption by Firm Age*

Based on the data from Table 6 and the chart from Figure 6 about the Cloud-Based Collaboration Platform Adoption & Business Model Impact - Adoption Patterns by Firm Age Cohorts, Cloud-based collaboration platform and artificial intelligence automation adoption within architectural firms reveal Among 120 architectural firms, cloud platform adoption is 45%, AI automation adoption is just 24.17%, and only 10.83% use both—showing that most firms do not combine these technologies. A large 41.67% segment adopts neither, 34.17% adopt only cloud, and 13.33% AI-only, revealing a trimodal, fragmented tech landscape. Adoption patterns are statistically independent of business model change (cloud: χ^2=0.15, p=0.985; AI: χ^2=3.05, p=0.384) and firm age (χ^2=6.01, p=0.739), with no significant links found. Cloud and AI adoption do not correlate (χ^2=0.00, p=1.000), and technology choices are made in isolation, not strategically paired. This indicates tech adoption in architecture is driven by firm-specific factors—such as leadership or client needs—rather than industry trends, business strategy, or demographics.

RQ2.3 BIM-Cloud Integration Analysis (Technology Clustering for USD 38B IT-BPO Ecosystem). It identifies BIM integration and digital twin/AI tools adoption patterns and identifies firms with integrated BIM + Cloud stacks ready for IT-BPO ecosystem participation.

Table 7. Four Cluster Profiles: BIM-Cloud Integration & Tech Maturity

Cluster	BIM	Cloud Tools	Count	Percentage	Dominant Tech Adoption
Digital Leaders	Yes	Yes	18	15.0%	Mixed (27.8% Very Low to 27.8% High
Cloud Pioneers	No	Yes	36	30.0%	Moderate (30.6%)
BIM Specialists	Yes	No	28	23.3%	Moderate (35.7%)
Traditional Firms	No	No	38	31.7%	High (34.2%) & Moderate (28.9%)

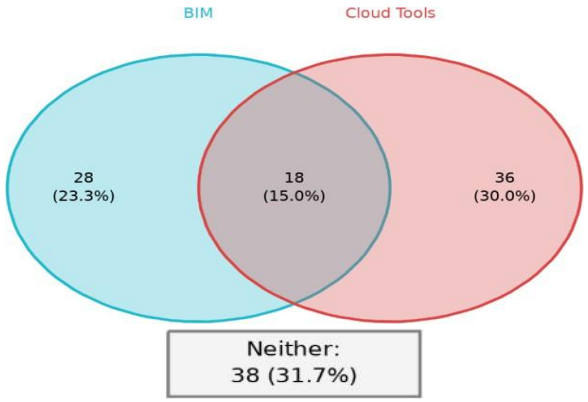

Figure 7. *Venn diagram or cluster profile showing BIM-Cloud Integration and Tech Maturity levels*

Data in Table 7 on the Four Cluster Profiles: BIM-Cloud Integration & Tech Maturity and the Venn diagram in Figure 7 analyses the BIM-cloud technology adoption across 120 architectural firms reveals strong fragmentation: 15% (n=18) are fully integrated Digital Leaders, 30% (n=36) are Cloud Pioneers with only infrastructure, 23.3% (n=28) are BIM Specialists without cloud, and 31.7% (n=38) are Traditional Firms with neither technology. Co-occurrence tests show BIM and cloud tech are adopted independently (χ^2=0.69, p=0.406), with only 22% achieving full integration and

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most firms (53.3%, n=64) adopting just one, cloud adoption typically preceding BIM. This creates a major integration gap and signals multi-tier market opportunities: Digital Leaders need advanced optimization, Cloud Pioneers are prime for BIM upsell, BIM Specialists require cloud migration, and Traditional Firms are primary candidates for digital transformation. The $38B IT-BPO sector must focus on both integrated solutions and standalone tech offerings to address distinct, independent adoption paths in architectural decision-making.

RQ2.4. Digital Infrastructure Commitment & IT-BPO Absorption Capacity. Assessing the readiness to leverage the Philippine IT-BPO sector capabilities and measures absorption capacity for external IT-BPO services integration.

Table 8. Firm Distribution by Readiness Tier

Readiness Tier	Firm Count	Percentage	Characteristics
Tier 1: Ready	3	2.5%	Very High Adoption + Annual Investments + IT-aligned priorities
Tier 2: Capable	25	20.8%	High adoption + Regular investments + Strategic IT focus
Tier 3: Emerging	55	45.8%	Moderate adoption + Mixed investment cadence + Diverse priorities
Tier 4: Basic	28	23.3%	Low-Moderate adoption + Infrequent investments + Limited IT focus
Tier 5: Not Ready	9	7.5%	Very Low adoption + Rare investments + No IT strategic priority

Architectural firms show very limited IT-BPO absorption capacity: only 2.5% (n=3) are fully "Ready" for advanced IT-BPO, 20.8% (n=25) are "Capable" with high adoption, 45.8% (n=55) are "Emerging" with moderate adoption, 23.3% (n=28) are "Basic" with low investment, and 7.5% (n=9) are "Not Ready". Only 23.3% have high absorption readiness (tiers 1–2), 45.8% moderate (tier 3), and 30.8% (n=37) low (tiers 4–5), meaning 69% lack strategic IT alignment and sustained investment. Digital investment is rare: just 23.3% invest regularly, while 69.2% show mixed/infrequent patterns and 7.5% barely invest. With only 3 firms "IT-ready," and most in the Emerging tier, industry growth requires systematic interventions, coordinated investment, and bundled service strategies focused on improving digital infrastructure and readiness across all segments based on the data in Table 8.

RQ2.5 AI-Aided Design Tool Adoption Trajectory & Future Digital Transformation. Explores AI-aided design tools adoption and pathway to IT-BPO-enabled services and shows cutting-edge technology adoption and commitment to emerging IT-BPO services.

Table 9. Six-Stage AI Adoption Pathway Model

Adoption Stage	Current AI Use	Future Investment	N	With AI Focus	%
Stage 1: Early Adopters	Yes	Very Unlikely/Unlikely	8	1	6.7%
Stage 2: Consolidators	Yes	Neutral	10	0	8.3%

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Stage 3: Accelerators	Yes	Likely/Very Likely	11	2	9.2%
Stage 4: Interested	No	Neutral	25	8	20.8%
Stage 5: Fast Followers	No	Likely/Very Likely	46	8	38.3%
Stage 6: Laggards	No	Very Unlikely/Unlikely	20	4	16.7%

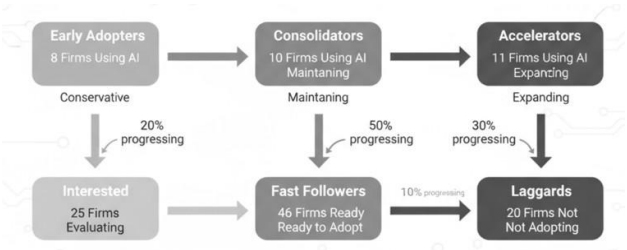

Figure 8. *Adoption pathway diagram showing current AI use vs. Future Innovation Plans*

The AI adoption model for architectural firms in Table 9 shows that only 24.2% are current users, but the largest segment—Fast Followers (38.3%)—is ready to adopt, signaling potential tripling of adoption to 83.3% if intentions are realized. Among current users, most remain stable or contract (Early Adopters: 6.7% with low intent, Consolidators: 8.3% maintain, Accelerators: 9.2% expand), while 75.8% are non-users split into Fast Followers (high intent, 38.3%), Interested (neutral, 20.8%), and Laggards (resistant, 16.7%). Only 19.2%-mark AI as a core innovation, revealing a gap between adoption plans and real strategic investment. The adoption pathways in Figure 8 show 76.7% could be reached through progressive engagement (Interested to Fast Followers to Accelerators), but 37.5% risk non-adoption due to resistance or fatigue. For IT-BPO AI providers, this means targeting immediate integration for Accelerators, entry-level support for Fast Followers (the largest opportunity), pilots for Interested firms, maintenance for Consolidators, niche support for Early Adopters, and foundational digital training for Laggards. Success depends more on converting the substantial 59.1% demand pipeline than current penetration, requiring support, training, and proof-of-value to bridge the gap between intent and actual transformation.

RQ3. What strategies can local firms adopt to shift competition from price-based to value-added services within the expanding domestic and ASEAN construction markets?

RQ3.1 Market Segment Value-Add Positioning by Project Type. Identifies market opportunities in domestic and ASEAN construction markets for value-added services and shows which market segments (Residential, Commercial, Gov't, Industrial, Mixed-use) are transitioning to value-added.

Table 10. Value-Add Readiness by Project Type

Project Type	Firm	Avg Readiness	Range	Business Model Focus	Innovation Focus
Residential	33	3.11	2.00- 4.50	No Change (36%)	Collaborative (27%)
Commercial	46	2.92	1.50- 4.50	No Change (46%)	Sustainable Design (30%)
Mixed-use	14	2.96	1.50- 4.00	Moderate Change (43%)	Sustainable Design (36%)

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Institutional	17	2.88	1.88- 4.38	Slight Change (41%)	Balanced Portfolio
Industrial	10	2.85	1.75- 4.25	Slight Change (40%)	Data Analytics (50%)

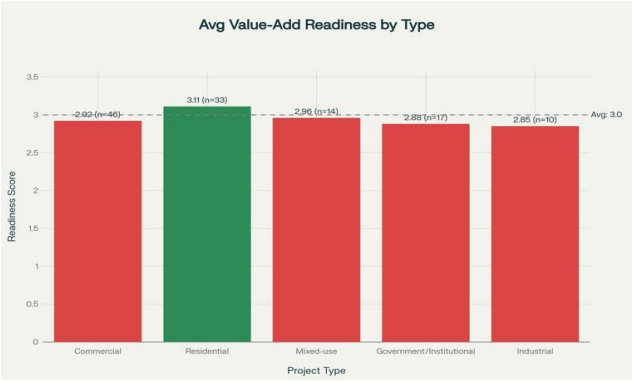

Figure 9. *Average Value-Add Readiness by Type*

Data from Table 10 where market segmentation by architectural project type reveals distinct value-add readiness and innovation positioning. Residential firms show the highest readiness (3.11/5.0, 27.5% share), ideal for premium collaborative and IT-BPO services, but 64% retain traditional models, indicating technical capability without strategic change. Commercial firms, the largest segment (38.3%), have moderate readiness (2.92/5.0) and focus on scalable sustainable design services, with 54% transitioning their models. Mixed-use (2.96/5.0, 11.7%) and Institutional (2.88/5.0, 14.2%) segments are intermediate; Mixed-use leads business model transformation (43% moderate change, 36% sustainable design commitment), making it most receptive to innovation. Institutional is stable, addressing compliance and diverse needs. Industrial, though smallest (8.3%), ranks lowest for readiness (2.85/5.0) yet highest for data analytics specialization (50%). All segments cluster within moderate readiness (2.85-3.11/5.0), stressing a profession-wide capacity for value-add rather than strong segment differences. Optimal IT-BPO strategy should focus on residential premium, commercial scaling, mixed-use for pilots, institutional for compliance, and industrial for data-driven services to cover varied market needs instead of a single unified approach (Figure 9).

RQ3.2 Innovation Priority & Service Diversification Portfolio Strategy. Develops a comprehensive value-based competition framework through service diversification and maps service diversification strategies by firm size and market segment.

Table 11. Firm Size Diversification Profiles

Firm Size	Firm	Market Share	Diversification	Focus	Strength
1-10 (Small)	49	40.8%	1.00	Balanced portfolio	Collaborative + Sustainable
11-30 (Mid- Small)	32	26.7%	1.00	Automation/AI focus	8 firms leading AI adoption
31-50 (Mid)	21	17.5%	1.00	Analytics + Design	Residential specialists (33%)
51-100 (Mid- Large)	13	10.8%	1.00	Commercial dominance	Enterprise solutions (46%)
100+ (Large)	5	4.2%	0.68	Niche specialization	Balanced C/R (40% each)

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Figure 10. *Market Position: Firm Size x Type*

Architectural firms' strategic positioning in the digital innovation landscape, in Table and Figure 10, shows a diverse and fragmented market, with 56 combinations identified across firm size, project type, and innovation priority (covering 56% of possible markets). Three innovation priorities—Sustainable Design Tech (26.7%), Data Analytics (21.7%), and Automation/AI (19.2%)—are classified as market "stars" with high coverage and growth, while Collaborative Platforms (22.5%) act as a "cash cow" with solid market presence. Leadership is seen in small firms across major segments, especially in residential (Collaborative Platforms: 5.8%) and commercial (Sustainable Design Tech: 5.8%), covering 13% of strategic positions. All priorities show broad diversification (11-16 combinations each), with no single innovation dominating any segment—Collaborative Platforms in small residential firms lead only 25.9% of that segment. This indicates firms gain advantage through integrated strategies involving size, project type, and innovation, rather than focusing narrowly on one dimension.

Sustainable competitiveness relies on portfolio coherence and multi-dimensional integration rather than single-focus specialization.

RQ3.3 Revenue Investment Adequacy in Value-Added Service Capabilities. Identifies specific market needs that Philippine firms can address through value-added service portfolios and shows whether firms allocate sufficient revenue resources to develop value-added service capabilities.

Table 12. Combined 3-Way Matrix: Tech Revenue × Tech Adoption × Innovation Priority

Revenue %	AL	Firm	AP	BIM %	Cloud %	AI %	AA
<5%	Very Low	13	1.08	53.8%	38.5%	15.4%	1.60
<5%	Low	7	1.14	28.6%	57.1%	28.6%	1.95
<5%	Moderate	22	0.77	31.8%	36.4%	9.1%	2.00
<5%	High	14	0.86	28.6%	42.9%	14.3%	2.38
<5%	Very High	4	1.50	75.0%	25.0%	50.0%	3.16
5-10%	Very Low	11	1.09	27.3%	54.5%	27.3%	2.11
5-10%	Low	5	1.80	60.0%	80.0%	40.0%	2.93
5-10%	Moderate	11	1.18	45.5%	45.5%	27.3%	2.80
5-10%	High	7	1.14	42.9%	28.6%	42.9%	3.08
5-10%	Very High	7	1.14	28.6%	42.9%	42.9%	3.39
11-20%	Very Low	2	1.00	0.0%	50.0%	50.0%	2.54
11-20%	Moderate	2	1.50	50.0%	50.0%	50.0%	3.54
11-20%	High	7	1.29	57.1%	42.9%	28.6%	3.69

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11-20%	Very High	3	1.33	33.3%	100.0%	0.0%	4.03
>20%	Very Low	2	1.00	0.0%	100.0%	0.0%	3.04
>20%	High	3	0.67	33.3%	0.0%	33.3%	3.74

Legend: AL – Adoption Level; AP – Average Capability; AA – Average Adequacy

Analysis of 120 architectural firms shows major misalignment between technology investment and service capability, with 84.2% of firms underinvesting in advanced service capabilities. Across all revenue tiers, service capability averages remain low (0.95-1.29 out of 3 per firm), and investment adequacy is poor (2.07-3.58 out of 10). The gap is most pronounced in high-tech adopters: 32.5% of firms pursue high technology adoption with adequacy scores below 4.0, showing systematic under-resourcing. Cloud tools see higher adoption rates (40-57%) than advanced AI automation (16-34%), indicating investment in basic infrastructure but not added value services. No firms achieve excellence (8.0+ on adequacy), even among top revenue performers, with the best averaging only 3.46. This widespread capability constraint undermines competitiveness, as high-tech adoption is not matched by service capability development, revealing an industry-wide need to realign technology strategy and investment for sustainable value creation (Table 12).

RQ3.4 Competition Pressure & Value-Based Service Shift Readiness. Develop strategies for competing on value within ASEAN markets and show if competition-facing firms are ready to shift to value-based models

Table 13. Matrix Table on Competition, Business Model Change, and Future Investment

Business Model Change	Very Unlikely	Unlikely	Neutral	Likely	Total
No Change	1	3	4	8	16
Slightly Changed	3	2	5	0	10
Moderately Changed	0	0	3	4	7
Significantly Changed	0	0	4	0	4
Column Total	4	5	16	12	37

The matrix in Table 13 reveals the distribution of 37 architectural firms that identified Competition as their primary growth barrier (30.8% of the 120 total respondents). The data shows how business model adaptation correlates with future digital investment commitment.

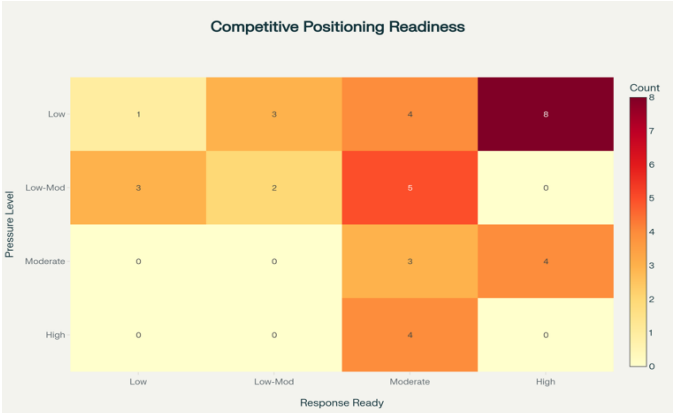

Figure 11. *Competitive Positioning Readiness*

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Table 13 and Figure 11 show that among 37 architectural firms, only 32.4% maintain strong digital investment and optimal business model alignment, while 37.8% favor cautious, incremental changes; 21.6% are vulnerable to market shifts due to limited digital resources. Industry-wide, 43.2% display neutral investment hesitation and just 10.8% pursue major business model transformation, revealing a preference for incremental adaptation over bold action. Competitive pressures do spark business model discussions, but financial and strategic constraints frequently limit decisive technological investment, leaving under-resourced firms exposed and giving well-aligned firms the potential to achieve stronger market positions through advancing digital capabilities.

RQ3.5 Skills & Expertise Gaps for Value-Added Service Delivery. Framework development identifying capability requirements for service diversification and the capability and cultural barriers preventing service diversification

Table 14. Skills Gap by Innovation Priority × Firm Maturity

Innovation Priority	<5 years	5-10 years	11-20 years	>20 years	OVERALL
Automation/AI	1 (2.00)	9 (0.78)	7 (1.00)	6 (1.67)	23 (1.13)
Data Analytics	5 (1.00)	9 (1.44)	7 (1.71)	5 (0.80)	26 (1.31)
Collaborative Platforms	3 (1.67)	5 (1.00)	14 (1.57)	5 (1.60)	27 (1.48)
Sustainable Design Tech	5 (1.20)	9 (0.89)	11 (1.45)	7 (1.86)	32 (1.34)

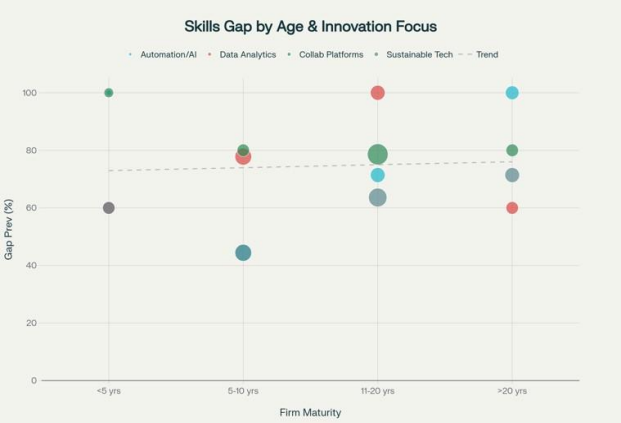

Figure 12. *Skills Gap by Age & Innovation Focus*

The architectural services industry's Maturity Paradox—where established firms face worse skills gaps than younger competitors, which represents an urgent strategic crisis. With 68.3% of firms experiencing barriers and mature firms showing 35% worse performance, the industry has a 3–5-year window to invest in upskilling, cultural transformation, and talent development before capability gaps create irreversible competitive disadvantages. Firms that benchmark against 5-10 year "sweet spot" leaders will establish sustainable advantages over those that delay (Table 14 and Figure 12).

RQ4. How can enterprise architecture frameworks and digital platforms enable Philippine firms to participate in large-scale government infrastructure projects and create recurring revenue streams?

RQ4.1 Enterprise Architecture Maturity for Large-Scale Government Projects. Examines EA framework implementation for government infrastructure project participation and assesses EA maturity indicators (size, adoption, BIM, platform) for govt project readiness

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Table 15. Government Project Readiness Thresholds

Tier	Score Range	Readiness Level	Firms Count	% of Sample	Government Project
Initial	5-24	Not Ready	10	8.7%	Not eligible
Basic	25-44	Limited Capability	42	36.5%	Simple projects only
Intermediate	45-64	Moderate Capability	30	26.1%	Standard complexity
Proficient	65-84	High Capability	27	23.5%	Complex projects
Advanced	85-100	Full Capability	11	9.6%	All project types

Table 16. Multi-way Cross-Tabulation with EA Maturity Tier Classification

(Firm Size, Tech Adoption)	Int'l	Basic	Intr	Prof	Adv
(100, Low)	0	0	1	1	0
(100, Moderate)	0	0	1	0	0
(100, Very Low)	2	0	0	0	0
(1-10, High)	0	4	0	5	1
(1-10, Low)	0	0	7	0	0
(1-10, Moderate)	0	5	11	0	1
(1-10, Very High)	0	2	0	1	2
(1-10, Very Low)	3	5	0	2	0
(11-30, High)	0	6	0	3	2
(11-30, Low)	1	0	1	1	0

Data from Tables 15 and 16, the multi-way cross-tabulation spanning 120 surveyed firms, reveals how Firm Size, Technology Adoption Level, BIM usage, and Cloud Tools adoption jointly drive organizational EA maturity tier. Small firms (1-10 employees) are highly clustered in the lower tiers, with 3 in Initial and 5 in Basic for very low-tech adoption, but those with very high-tech adoption and dual BIM/cloud implementation move into Advanced (2 firms) or Proficient (1 firm), indicating clear transformation benefit. Among firms with 100+ staff, low or moderate tech adoption alone rarely produces more than Intermediate readiness, highlighting the critical role of advanced digital tools. Medium-sized firms (11-30) with high-tech adoption and full toolset advance proportionally into Proficient or Advanced tiers (3 and 2 firms respectively). Across all sizes, attaining the Advanced tier requires both high-tech adoption and comprehensive implementation of BIM and cloud tools. The EA maturity distribution, therefore, demonstrates that digital transformation is a prerequisite for top-tier government readiness and market competitiveness, with the most significant advancement observed among firms combining very high-tech adoption with full digital tool usage.

RQ4.2 Platform Business Model Adoption Stage & Government Project Capability. Provides practical guidance on platform business models for recurring revenue and identifies firms transitioning to platform models and the capability for large projects

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Table 17. Government Project Readiness by Adoption Stage

Stage	Firm	Readiness	Score	Project Type	Market Gap
4	0	Optimal	9	$500M+ mega	100% Unserved
3	17	Strong	7	$50-500M major	85.8% Constrained
2	89	Moderate	5	$5-50M standard	Capacity Adequate
1	14	Limited	3	<$5M pilot	Over-served

*Score is out of 10

Analysis of 120 architectural firms shows in Table 17 the widespread strategic misalignment between digital ambitions and operational capability, leading to market fragmentation, underfunded service development, and poor government project readiness (Table/Figure reference). Only 26.7% of firms align technology adoption with adequate investment, while 73.3% operate with resource gaps, and 84.2% remain in critical capability tiers, averaging just 32–43% of potential service deployment. Competition is a growth barrier (30.8% of markets), yet 100% of affected firms are classified as "At Risk" or "Endangered," with no proactive investment commitments. All government- focused firms operate at immature enterprise architecture levels, leaving a $10B+ annual opportunity unserved as zero firms qualify for large-scale projects. Skills gaps affect 68.3% of firms, with paradoxically higher deficits in mature organizations. Platform adoption is stuck at moderate readiness: 74.2% of firms can only support standard projects, and cloud adoption is a key driver, but integrated transformation lags. Advancing to higher maturity stages could unlock transformational market share. Overall, decisive capability investment, enterprise maturation, and digital upskilling are needed to capture emerging opportunities and strengthen competitive positioning, as current market leaders often have the greatest capability deficits.

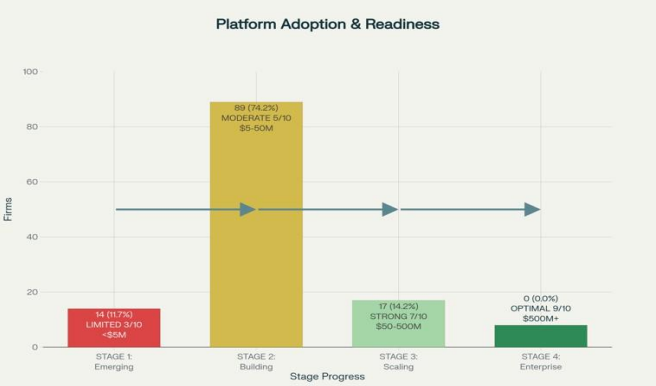

Figure 13. *Platform Adoption Stage Progression*

Figure 13 shows firm distribution and government readiness levels

RQ4.3 Continuous Technology Investment Commitment for EA Sustainability. Details how firms adopt TOGAF for business-technology strategic alignment and identify firms committed to sustained EA development and govt project capability.

Table 18. Investment Frequency × Tech Revenue %

Investment Frequency	<5%	5-10%	11-20%	>20%	OVERALL
Annually	6 (7.0)	7 (7.2)	3 (8.0)	-	16 (7.3)
Every 2-3 years	14 (5.5)	12 (6.2)	4 (7.4)	2 (7.4)	32 (6.1)
Every 4-5 years	19 (4.6)	16 (4.8)	3 (6.3)	2 (5.2)	40 (4.8)
Rarely/Never	-	-	-	-	32 (N/A)

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Figure 14. *Investment sustainability by frequency and future commitment*

The architectural services industry demonstrates fundamental inability to sustain technological capability development despite universal recognition of digital transformation necessity, with 56.7% operating at risk or critical status due to infrequent investment cycles (67% invest every 4-5 years or rarely vs. optimal 2-3 years), insufficient revenue allocation (50% below 5% threshold), and fragmented strategic coordination (only 2.5% integrate all three dimensions). The crisis manifests as accumulating technological debt, widening capability gaps, and 27 firms (22.5%) facing imminent decay within 18-24 months. Industry Requires.

$100-150M coordinated investment over 24-36 months to accelerate frequency (54 firms), reallocate revenue (60 firms), and establish integrated sustainability strategies (117 firms), with first movers to SUSTAINABLE status positioned to capture disproportionate market share as capability differentiation accelerates (Table 18 and Figure 14).

RQ4.4 Digital Platform Maturity vs. Government Infrastructure Project Readiness. Provides practical TOGAF implementation guidance for strategy-technology alignment and assesses platform maturity and identifies barriers to government infrastructure project participation.

Table 19. Tech Stack × Tech Adoption Level (n=120)

Tech Stack	Very Low	Low	Moderate	High	Very High	OVERALL
No Stack (0/3)	7 (2.0)	1 (2.4)	9 (3.1)	8 (4.2)	2 (4.7)	27 (3.2)
Basic Stack (1/3)	13 (3.4)	7 (4.0)	20 (5.0)	16 (5.7)	7 (6.6)	63 (4.9)
Strong Stack (2/3)	7 (5.2)	2 (5.6)	5 (6.5)	6 (6.9)	4 (7.9)	24 (6.4)
Full Stack (3/3)	1 (6.7)	2 (7.3)	1 (8.1)	1 (8.8)	1 (8.8)	6 (7.8)

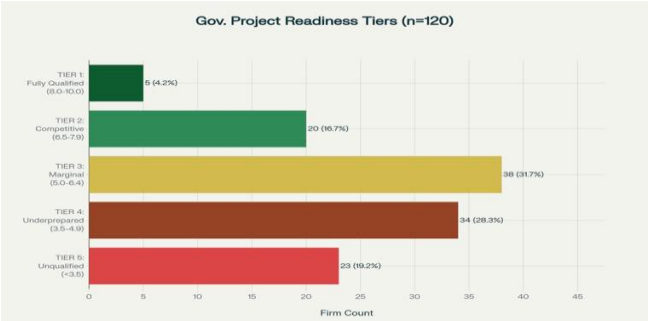

Figure 15. *Gov't Project Readiness Tiers*

Based on the data in Table 19 about the Tech Adoption Level of firms and the Readiness of Firms in Government Projects in Figure 15, Analysis of 120 architectural firms reveals critical government project readiness crisis where only 20.8% (25 firms) qualify as competitive or fully qualified (TIER 1-2) for major government contracting, while 47.5% (57 firms) remain underprepared or unqualified (TIER 4-5), with average

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readiness score of 4.98/10.0 indicating systematic capability gaps across technical stack implementation (77.5% lack full BIM+Cloud+AI integration) and organizational maturity (33.3% operate at Very Low/Low adoption levels), compounded by severe barrier impacts where firms facing Limited Financing (26 firms, 3.56 avg readiness, 3.8% qualified) and Skill Shortages (6 firms, 3.35 avg, 0% qualified) demonstrate near-universal disqualification from government work.

CONCLUSION AND RECOMMENDATION

Philippine architecture firms stand at a critical juncture. The domestic construction market demonstrates robust growth with the Build Better More program representing USD 176.7 billion in 207 infrastructure flagship projects (NEDA, 2023), while the construction market is projected to reach USD 60.08 billion by 2033 (IMARC Group, 2024). ASEAN markets offer significant regional expansion opportunities. Simultaneously, digital technologies including BIM, digital twins, cloud platforms, and AI-aided tools create unprecedented possibilities for service innovation.

However, survey findings reveal that local firms remain structurally constrained: 50% allocate less than 5% of revenue to technology, 33.3% report very low or low technology adoption, 37.5% experienced no business model changes, and 61.7% cite high implementation costs as a barrier. These constraints stem from traditional fee-for-service business models, regulatory frameworks designed for conventional practice, and limited access to capital and technology investments.

This research addresses this paradox by developing a framework enabling Philippine architecture firms to transition from traditional project-based models to scalable, platform-based business models. The framework integrates three complementary theoretical foundations: Dynamic Capabilities Theory explaining how firms develop organizational capabilities for innovation, Platform Ecosystem Theory demonstrating how digital platforms create exponential value through network effects, and Enterprise Architecture Framework Theory providing structured methodologies for systematic transformation.

The integrated framework consists of five interconnected components providing actionable guidance for transformation: Strategic Assessment and Vision Development, Enterprise Architecture Design, Dynamic Capabilities Development, Platform Business Model Innovation, and Implementation Roadmap and Governance.

The framework addresses each research question through specific mechanisms: Traditional constraints are overcome through hybrid business models; IT-BPO leverage is achieved through strategic partnerships; value-based competition emerges from service diversification and platform value creation; large-scale project participation results from enterprise architecture capabilities and platform business models generating recurring revenue.

Philippine architecture firms that successfully implement platform-based business models will be positioned to capture greater value from the expanding construction market, participate effectively in large-scale infrastructure projects, expand into high-growth ASEAN markets, develop sustainable competitive advantages, and contribute to broader construction industry transformation.

The transformation journey requires systematic commitment, strategic investment, and organizational adaptation. However, the convergence of market opportunity (USD 60.08 billion by 2033), technology enablement (USD 38 billion IT-BPO sector), and strategic frameworks creates an unprecedented window for Philippine architecture firms to evolve from fragmented commodity providers to leaders of integrated platform ecosystems driving regional construction industry innovation.

The choice facing Philippine architecture firms

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is clear: continue operating within constraining traditional models and cede opportunities to international competitors or embrace systematic transformation toward platform-based business models capturing the full value potential of the expanding construction market. This framework provides the roadmap for firms choosing transformation, innovation, and leadership.

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