

Business Model Innovation from a Human Resource Empowerment Perspective: Research on Business Ecosystem Construction of Chinese Enterprises

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ABSTRACT

This research investigates how human resource empowerment influences business model innovation and business ecosystem construction in Chinese enterprises. Adopting a mixed-methods approach integrating case studies of Huawei, Alibaba, and Haier with a survey of 213 Chinese enterprises, the study examines the mechanisms through which human resource empowerment practices contribute to ecosystem development. The findings reveal that human resource empowerment positively affects business ecosystem construction both directly ($\beta = 0.297$) and indirectly through business model innovation ($\beta = 0.163$). Among the dimensions of empowerment, developmental empowerment demonstrates the strongest influence on ecosystem construction ($\beta = 0.358$), while psychological empowerment most significantly impacts business model innovation ($\beta = 0.386$). Digital maturity enhances the relationship between human resource empowerment and ecosystem construction, while institutional support strengthens the translation of business model innovations into ecosystem development. The case studies illustrate how different empowerment forms support distinct ecosystem strategies while revealing implementation challenges. This research contributes to management theory by addressing a critical gap through demonstrating how human resource empowerment creates microfoundations for ecosystem capabilities, extending beyond the traditional technological focus. The findings emphasize the strategic importance of aligning human resource empowerment approaches with ecosystem objectives and integrating human and technological capabilities for sustainable business ecosystem development.

KEYWORDS

Human resource empowerment; Business model innovation; Business ecosystem; Digital platform; Enterprise microfoundations; Chinese enterprises

1. Introduction

In the context of rapid digital transformation and economic restructuring, Chinese enterprises face unprecedented challenges and opportunities in business model innovation. The emergence of business ecosystems as a new organizational form is reshaping how enterprises create value and compete in the global market (Li et al., 2023). While technological advancements and platform development have received significant scholarly attention in driving business ecosystem construction, the human dimension—particularly human resource empowerment—remains comparatively underexplored despite its critical importance (Loon et al., 2020).

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Human resource empowerment, encompassing both structural and psychological dimensions, has transformed from a traditional management approach into a strategic driver for organizational innovation and competitive advantage (Aust et al., 2020). In China's unique institutional and cultural context, human resource empowerment demonstrates distinctive characteristics that significantly influence how Chinese enterprises develop their business models and construct business ecosystems (Guo et al., 2013). The digital economy has further amplified the importance of human capital, as knowledge creation, sharing, and application become increasingly central to value creation and ecosystem orchestration (Jiao & Sun, 2021).

Business ecosystems represent complex adaptive systems of interdependent stakeholders that co-evolve around focal organizations or platforms (Rong et al., 2018). Chinese enterprises have demonstrated remarkable success in building vibrant business ecosystems, as exemplified by companies like Huawei, Alibaba, and Haier (Li & Li, 2021; Li et al., 2020). These enterprises have not only transformed their business models but also cultivated extensive ecosystems that create shared value across multiple stakeholders. However, a critical research gap exists as existing literature has predominantly focused on technological factors and platform strategies, while significantly underexploring how human resource empowerment contributes to ecosystem construction and business model innovation (Koster & Benda, 2020). This gap is particularly pronounced in understanding the mechanisms through which empowered human resources serve as microfoundations for ecosystem development.

From a microfoundational perspective, business model innovation and ecosystem construction ultimately depend on human actions and interactions. The capabilities, motivations, and behaviors of individuals and teams, shaped by human resource management practices, form the basis upon which successful business ecosystems are built. Digital transformation intensifies this relationship, as it demands new skills, mindsets, and ways of working that can only be developed through strategic human resource empowerment (Plis & Schislyaeva, 2020). Despite this fundamental importance, empirical evidence linking human resource empowerment practices to business ecosystem outcomes remains limited, particularly in the Chinese context where unique cultural and institutional factors may influence these relationships.

To address this significant theoretical and empirical gap, this research aims to bridge this gap by exploring the nexus between human resource empowerment, business model innovation, and business ecosystem construction in Chinese enterprises. Specifically, it addresses three key questions: (1) How does human resource empowerment influence business model innovation in Chinese enterprises? (2) What are the key mechanisms through which human resource empowerment facilitates business ecosystem construction? (3) How can Chinese enterprises strategically leverage human resource empowerment to enhance the sustainability of their business ecosystems?

This study investigates leading Chinese enterprises that have successfully implemented human resource empowerment in business ecosystem development using a mixed-methods approach combining case studies and survey research. The findings will advance both theoretical understanding and practical knowledge by elucidating the processes through which human resource empowerment facilitates business model innovation and ecosystem development in the Chinese context. By highlighting the human dimension of business ecosystems, this study broadens understanding of how Chinese enterprises can achieve sustainable development in the digital economy while simultaneously contributing to global management theory and practice. This research makes a unique theoretical contribution by positioning human resource empowerment as a critical microfoundation for business ecosystem construction, thereby extending existing ecosystem theory beyond its current technological focus.

2. Literature review and research hypotheses

2.1 Research progress on business ecosystems

In the context of business ecosystems, there has been significant development in theory and organizational interconnections related to value creation. Moore first coined the term, arguing that organizations grow alongside their surroundings and, like biological organisms, require adaptive mechanisms to survive and flourish through constant change. Moore's subsequent work has integrated this perspective, offering a contemporary four-stage model for understanding business ecosystems based on systems theory. A business ecosystem is defined as a complex adaptive system consisting of autonomous entities that work toward value generation and capture in a coordinated manner that exceeds the capabilities of any single firm. This definition captures the essence of transcending traditional industry boundaries (Dias Sant'Ana et al., 2020).

One of the main characteristics of business ecosystems is their dynamic nature. Emphasizing this dynamism, Rong et al. (2018) argue that research should shift from analyzing static frameworks to studying evolutionary processes. Ecosystems are created, grown, governed, and renewed through continuous processes. Chinese companies such as Alibaba and Huawei provide compelling illustrations of this dynamism, having repeatedly transformed their business models and extended ecosystem boundaries in response to emerging technological and market opportunities (Li & Li, 2021). Dynamic capabilities such as opportunity sensing and resource reconfiguration are essential for effective ecosystem orchestration (Andreassen et al., 2018).

Another fundamental dimension involves embedding business ecosystems within broader social, cultural, and institutional frameworks. In China, where business relationships are heavily based on interpersonal connections (*guanxi*), most ecosystems rely on social networks, government relations, and cultural values. This creates unique challenges and opportunities for Chinese enterprises in ecosystem construction and management. Studies indicate that Chinese ecosystem leaders strategically leverage government support, cultural capital, and social networks as embedded resources for ecosystem development (Li et al., 2020).

The sustainability of business ecosystems has emerged as a critical research focus. Li et al. (2023) have investigated sustainable business model innovation driven by digital platform ecosystems, while recent research has demonstrated that business model innovation plays a crucial role in crisis management through the mediating effects of entrepreneurial capability, resilience, and business performance (Salamzadeh et al., 2023). These studies highlight the potential of business ecosystems to create sustainable value across economic, social, and environmental dimensions, particularly during challenging periods.

Based on the business ecosystem literature, the following hypothesis is proposed:

H1: Business ecosystem construction positively influences the sustainable development of Chinese enterprises.

2.2 Theoretical research on human resource empowerment

Human resource empowerment encompasses the processes and practices through which organizations enhance employees' capabilities, autonomy, and motivation to contribute to organizational objectives. Contemporary conceptualizations extend beyond traditional delegation to include both structural dimensions (authority, resources, information, and support) and psychological dimensions (meaning, competence, self-determination, and impact) (Aust et al., 2020). In the digital economy, human resource empowerment has evolved to incorporate knowledge sharing, collaborative innovation, and digital capability building (Koster & Benda, 2020).

From a microfoundational perspective, human resource empowerment provides the building blocks for organizational capabilities and competitive advantage. Microfoundations theory suggests that organizational-level outcomes ultimately derive from individual-level actions, interactions, and

capabilities. Loon et al. (2020) propose that human resource practices create the microfoundations for dynamic capabilities essential for business model innovation and ecosystem orchestration. These microfoundations include individual skills and knowledge, relational mechanisms, and organizational routines that collectively enable adaptation to changing environments.

The relationship between digital capabilities, dynamic capabilities, and business model innovation has become increasingly important, with organizational inertia serving as a significant moderating factor (Liu et al., 2024). This highlights how human resource empowerment must adapt to digital transformation demands while overcoming organizational resistance to change. Recent studies have examined innovative human resource management during challenging periods, highlighting adaptive strategies that organizations can implement to support employees while maintaining operational effectiveness.

In the Chinese context, human resource empowerment demonstrates distinctive features due to particular cultural, organizational, and institutional factors. Chinese firms exhibit a complex blend of empowerment practices with traditional hierarchical structures. For example, Haier's "Rendanheyi" model exemplifies this empowerment paradigm, combining market-based reward systems with strong corporate culture (Li et al., 2020). Guo et al. (2013) demonstrate how senior managers' human and social capital facilitate business model innovation in Chinese firms, emphasizing the leadership dimension within empowerment processes.

Research has also examined how start-up entrepreneurship and disruptive business models significantly influence firm performance, highlighting the importance of empowerment mechanisms in fostering entrepreneurial behaviors within established organizations (Niyawanont, 2023). These contextual factors significantly influence how Chinese enterprises implement and benefit from human resource empowerment in business ecosystem construction.

Based on the human resource empowerment literature, the following hypothesis is proposed:

H2: Human resource empowerment positively influences business ecosystem construction in Chinese enterprises.

2.3 Review of business model innovation research

Business model innovation represents a fundamental reconceptualization of how organizations create, deliver, and capture value. Unlike product or process innovation, business model innovation involves systemic changes to value propositions, value creation processes, value networks, and revenue models. Recent research has expanded to incorporate sustainability dimensions, digital transformation, and ecosystem perspectives (Lee et al., 2019).

Business model innovation and digital technology integration have become particularly relevant for incumbent small and medium-sized firms, offering new perspectives on adaptation and competitive positioning in digital markets (Sabatini et al., 2022). The conceptual framework for business model innovation encompasses multiple dimensions and approaches. Andreassen et al. (2018) propose a triadic approach focusing on value creation, resource configurations, and revenue models, highlighting the interrelated nature of business model components where innovation in one area often necessitates system-wide changes.

Sustainable business model innovation has gained increasing attention as organizations seek to integrate economic, social, and environmental value creation. Li et al. (2023) investigate mechanisms of sustainable business model innovation driven by digital platform ecosystems, identifying how platform characteristics like generativity, convergence, and modularity enable sustainable value creation. The integration of digital capabilities with dynamic capabilities represents a critical factor in enabling business model innovation, though organizational inertia can significantly moderate these relationships (Liu et al., 2024).

Digital platforms have emerged as powerful drivers of business model innovation, enabling new forms of value creation and ecosystem orchestration. For Chinese enterprises like Alibaba and Huawei,

platform-based business models have proven particularly effective in orchestrating complex ecosystems and responding to dynamic market conditions. These platforms reduce transaction costs, facilitate network effects, and enable unprecedented levels of customization and co-creation.

The relationship between human resource management and business model innovation represents an emerging research area. Studies suggest that human resource practices directly influence organizational capacity for business model innovation by shaping employee skills, behaviors, and collective capabilities (Loon et al., 2020). Apanasovich et al. (2018) propose an integrated "Research, Technology and Human Resource Management (RTH) model" emphasizing complementarity between technological innovation and human resource development.

In the Chinese context, Chang et al. (2021) conducted ethnographic research into Toutiao, revealing how user-driven business model innovation unfolds in Chinese settings. Recent research by Liu and Zhang (2024) has investigated how entrepreneurial bricolage affects business model innovation and sustainable entrepreneurial performance, with particular attention to digital entrepreneurial ecosystem empowerment effects.

Based on the business model innovation literature, the following hypotheses are proposed:

H3: Human resource empowerment positively influences business model innovation in Chinese enterprises.

H4: Business model innovation positively influences business ecosystem construction in Chinese enterprises.

2.4 Theoretical integration and research hypotheses

Drawing from the literature review across the three main domains—business ecosystems, human resource empowerment, and business model innovation—four key hypotheses have been developed that form the foundation of the research framework. These hypotheses capture the essential relationships between human resource empowerment, business model innovation, and business ecosystem construction in the Chinese context.

The first hypothesis (H1) posits that business ecosystem construction positively impacts Chinese enterprises' sustainable development. This reflects the established understanding that in today's globalized economy, firm success increasingly depends on managing value creation within networks of partners and complementors (Dias Sant'Ana et al., 2020; Hein et al., 2020).

The second hypothesis (H2) proposes that human resource empowerment positively impacts business ecosystem construction in Chinese enterprises. This hypothesis captures the importance of human capital as a driver of collaborative capabilities and ecosystem adaptive learning (Loon et al., 2020; Wang et al., 2022). As Wang et al. (2022) emphasize, ecosystem construction and collaboration platforms for enterprise open innovation rely heavily on human capabilities and collaborative engagement.

The third hypothesis (H3) states that human resource empowerment positively affects business model innovation in Chinese enterprises. Employee empowerment is identified as a critical factor for transforming value propositions, accessing new market segments, and implementing different business processes for value creation (Cooke et al., 2022; Nambisan et al., 2019).

The fourth hypothesis (H4) states that business model innovation positively affects business ecosystem construction in Chinese enterprises. This hypothesis reflects the reciprocal relationship between organizational innovation and ecosystem development, as new business models frequently require and enable new forms of collaboration among multiple business entities (Hanelt et al., 2020; Chang et al., 2024).

As shown in Figure 1, the research framework proposes a sequential relationship where human resource empowerment serves as a foundation for both business model innovation and business ecosystem construction. The framework highlights how these elements interact within the unique Chinese business context to ultimately contribute to sustainable enterprise development. This integrated

model provides a basis for empirical investigation and addresses the theoretical gap regarding the human dimension of business ecosystem construction in Chinese enterprises.

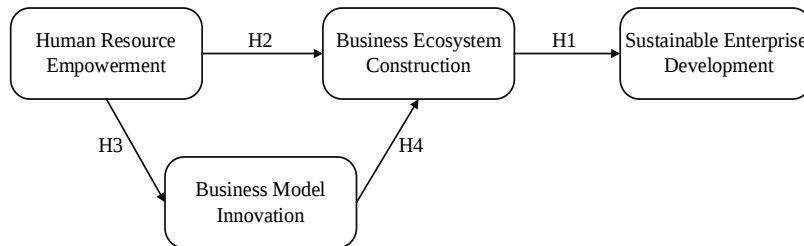


Figure 1 Research Framework of Human Resource Empowerment, Business Model Innovation, and Business Ecosystem Construction in Chinese Enterprises

3. Research design

3.1 Research methods

This study adopts a mixed-methods approach integrating qualitative case studies with quantitative survey research to comprehensively investigate the research questions. This methodological triangulation enhances both the depth and breadth of insights while mitigating limitations inherent in either approach used independently. The research follows a sequential exploratory strategy as outlined in Table 1, where initial case studies inform subsequent survey development and hypothesis testing.

Table 1 Sequential Mixed-Methods Research Design

Phase	Method	Purpose	Data Collection	Analysis Approach
Phase 1	Case Studies	Explore mechanisms linking HR empowerment, business model innovation, and ecosystem construction	Semi-structured interviews; Document analysis	Thematic analysis; Cross-case comparison
Phase 2	Survey Research	Test hypotheses; Validate findings across larger sample	Structured questionnaires	Structural equation modeling; Mediation and moderation analysis
Phase 3	Integration	Synthesize qualitative and quantitative findings	Comparison of case and survey findings	Pattern matching; Explanatory analysis

3.2 Sample selection

3.2.1 Case study sample

For the qualitative phase, purposive sampling was employed to select case enterprises demonstrating success in business ecosystem construction while implementing distinctive human resource empowerment approaches. As shown in Table 2, three representative companies were selected with variation in industry sectors, organizational sizes, and ecosystem types to capture different approaches to empowerment and ecosystem strategies.

Data collection included 21 semi-structured interviews with executives, middle managers, HR professionals, and frontline employees. Interviews lasted 45-60 minutes, focusing on human resource empowerment practices, business model innovation processes, and ecosystem construction strategies.

Table 2 Profiles of Case Study Enterprises

Enterprise	Industry	Size (Employees)	Ecosystem Type	Data Collection
Huawei	Technology	>207,000	Technology-centered ecosystem	8 interviews; Document analysis
Alibaba	Digital platform	>194,000	Platform-based ecosystem	7 interviews; Document analysis
Haier	Manufacturing	>112,000	Manufacturing-centered ecosystem	6 interviews; Document analysis

Document analysis of internal policies, annual reports, and public communications complemented the interview data.

3.2.2 Survey sample

For the quantitative phase, the target population comprised Chinese enterprises across multiple industry sectors. The sampling frame was developed using directories from industry associations, databases of enterprises participating in digital transformation initiatives, and listings from economic development agencies. Initial invitations were sent to 820 enterprises meeting the following criteria: operational history of at least three years, minimum annual revenue of 10 million RMB, and evidence of ecosystem participation.

Table 3 Distribution of Target and Respondent Samples

Industry Sector	Target Sample		Respondent Sample		Response Rate (%)
	n	%	n	%	
Technology	246	30.0	74	34.7	30.1
Manufacturing	205	25.0	51	24.0	24.9
Services	164	20.0	39	18.3	23.8
Retail & E-commerce	123	15.0	31	14.6	25.2
Others	82	10.0	18	8.4	22.0
Enterprise Size					
Large (>1000 employees)	320	39.0	87	40.8	27.2
Medium (300-999 employees)	320	39.0	79	37.1	24.7
Small (<300 employees)	180	22.0	47	22.1	26.1
Total	820	100.0	213	100.0	26.0

As indicated in Table 3, the final response rate was 26.0%, yielding 213 valid responses for analysis. Chi-square tests indicated no significant differences between the target sample and respondent sample distributions, suggesting non-response bias was not a significant concern.

3.3 Variable measurement and questionnaire design

The survey instrument was developed through a rigorous process integrating established scales with insights from case studies. To minimize common method bias, data were collected from multiple informants where possible, with different respondents completing sections related to their areas of expertise. All items were measured using 5-point Likert scales (1 = strongly disagree, 5 = strongly agree). The final questionnaire also included measures of control and moderating variables as shown in Table 4.

3.4 Analytical methods and hypothesis testing approach

3.4.1 Qualitative data analysis

Case study data analysis employed a straightforward textual analysis approach to identify key themes and patterns across the interview transcripts and organizational documents. Rather than formal coding procedures, systematic thematic content analysis of the collected qualitative data was conducted. For each case, comprehensive case narratives were first developed capturing the organization's approach to human resource empowerment and business ecosystem construction. Key insights related to the research questions were then extracted, particularly focusing on how human resource practices influenced business model innovation and ecosystem development activities. Cross-case comparison involved identifying common patterns and distinctive approaches across the three enterprises, with particular attention to contextual factors that appeared to shape these relationships. This analysis provided rich contextual understanding of the mechanisms linking human resource empowerment to business ecosystem construction, which informed both the survey design and interpretation of quantitative findings. The qualitative analysis prioritized practical insights over theoretical categorization, maintaining close connection to participants' expressed experiences and organizational realities.

Table 4 Measurement of Key Variables

Variable	Dimensions	Scale Source	Sample Item	Reliability (α)
Human Resource Empowerment	Structural Empowerment	Adapted from Kanter (as cited in Piwowar-Sulej, 2021)	"Employees have access to resources necessary to implement new ideas"	0.88
	Psychological Empowerment	Adapted from Spreitzer (as cited in Papademetriou et al., 2023)	"Employees find their work meaningful and aligned with their values"	0.91
	Developmental Empowerment	Developed from case studies	"The organization provides learning opportunities relevant to ecosystem needs"	0.87
Business Model Innovation	Value Proposition Innovation	Adapted from Clauss (2017)	"The organization frequently introduces new value offerings"	0.86
	Value Creation Innovation	Adapted from Clauss (2017)	"The organization has significantly changed how it creates value"	0.89
	Value Network Innovation	Adapted from Clauss (2017)	"The organization has reconfigured its network of partners"	0.85
	Value Capture Innovation	Adapted from Clauss (2017)	"The organization has developed new revenue streams"	0.82
	Ecosystem Governance	Developed from case studies	"The organization has established effective coordination mechanisms"	0.84
Business Ecosystem Construction	Collaboration Mechanisms	Developed from case studies	"The organization facilitates knowledge sharing among ecosystem members"	0.86
	Platform Development	Developed from case studies	"The organization has developed platforms supporting ecosystem interactions"	0.90
	Value Co-creation	Developed from case studies	"The organization involves partners in creating new value offerings"	0.88
	Firm Age	Single item	"Number of years since founding"	-
	Firm Size	Single item	"Number of full-time employees"	-
Moderating Variables	Industry Dynamism	Adapted from Jaworski & Kohli (as cited in Sun et al., 2024)	"Rate of change in our industry is high"	0.86
	Digital Maturity	Adapted from Kane et al. (as cited in Ouyang et al., 2024)	"The organization has integrated digital technologies in operations"	0.89
	Institutional Support	Adapted from Busenitz et al. (as cited in Cooke et al., 2023)	"Government policies support business ecosystem development"	0.84

3.4.2 Quantitative data analysis and hypothesis testing

Survey data analysis employed structural equation modeling (SEM) using AMOS 26 software to test the hypothesized relationships. Following Anderson and Gerbing's two-step approach, the measurement model was first assessed through confirmatory factor analysis, then the structural model and hypothesized relationships were tested.

To test the four hypotheses proposed in Chapter 2, the following analytical approaches were employed:

H1: Business ecosystem construction positively influences the sustainable development of Chinese enterprises - Tested through direct path analysis in the structural model, controlling for firm size, age, and industry.

H2: Human resource empowerment positively influences business ecosystem construction in Chinese enterprises - Tested through direct path analysis in the structural model, examining both the aggregate effect and the differential effects of the three HR empowerment dimensions.

H3: Human resource empowerment positively influences business model innovation in Chinese enterprises - Tested through direct path analysis in the structural model, with additional analysis of the relative effects of different HR empowerment dimensions.

H4: Business model innovation positively influences business ecosystem construction in Chinese enterprises - Tested through direct path analysis in the structural model.

Additionally, mediation analysis was conducted to examine whether business model innovation mediates the relationship between human resource empowerment and business ecosystem construction. Following the recommendations of Preacher and Hayes (as cited in Komm et al., 2021), bootstrap analysis (5,000 resamples) was used to test the significance of indirect effects and calculate confidence intervals.

Moderation analysis was conducted to examine how contextual factors influence the strength of key relationships in the model. Specifically, tests were conducted to determine whether digital maturity moderates the relationship between human resource empowerment and business ecosystem construction, and whether institutional support moderates the relationship between business model innovation and ecosystem construction. These moderation effects were tested using multi-group SEM analysis and interaction terms in regression models (Wang et al., 2024).

Prior to hypothesis testing, data were screened for potential issues including missing values, outliers, normality violations, and multicollinearity. Common method bias was assessed using Harman's single-factor test and the common latent factor approach, with appropriate remedial procedures implemented when warranted (Li & Li, 2021). This rigorous approach to data analysis ensured the reliability and validity of the findings, aligning with best practices in business ecosystem and human resource management research (Cooke et al., 2023).

4. Case analysis

4.1 Overview of case enterprises

The three selected case enterprises represent different approaches to ecosystem construction while demonstrating significant success in their respective domains. Huawei has evolved from a telecommunications equipment manufacturer to a global technology ecosystem orchestrator with operations in over 160 countries. With approximately 207,000 employees worldwide, Huawei has developed a complex business ecosystem encompassing hardware, software, services, and solutions across multiple technology domains. Alibaba exemplifies a platform-based approach to ecosystem development, having transformed from an e-commerce platform to a comprehensive digital ecosystem integrating commerce, finance, logistics, cloud computing, and entertainment. With over 194,000 employees, Alibaba has created one of China's most expansive business ecosystems characterized by platform-mediated value creation. Haier represents a manufacturing-centered ecosystem approach, having pioneered the "Rendanheyi" business model that transformed a traditional appliance manufacturer into an entrepreneurial ecosystem. With over 112,000 employees, Haier has created a unique ecosystem that combines manufacturing excellence with entrepreneurial innovation through its microenterprise structure.

4.2 Human resource empowerment practices

Every business case has embraced particular methodologies intended to strengthen human resource empowerment that are aligned with their ecosystem development strategies. Huawei has implemented a holistic empowerment system, known as "inspired dedication", marked by structural empowerment through decentralized power and psychological empowerment through cultural congruence. Their "rotating CEO" system distributes strategic decision-making power while maintaining organizational cohesion. The focus on developmental empowerment is seen through intense technical training and

leadership development programs, supported by heavy investments in research and development capacities as well as the development of technical capabilities. Huawei's human resource practices are marked by their focus on knowledge-intensive empowerment, especially with regard to the development of boundary-spanning capabilities that enable the integration of internal competencies with external alliances.

Alibaba has created an empowerment system focused on entrepreneurial autonomy and the development of competencies through a platform-based strategy. The company's human resource programs are based on what its leaders call "ecosystem thinking", which allows employees to identify opportunities for collaboration that lie outside the boundaries of the organization. This empowerment model combines structural elements through independent business units, psychological elements through a shared ethos symbolized by the "Six Vein Spirit Sword", and developmental elements through in-depth internal training programs and rotational practices. A notable aspect is their deliberate development of boundary-spanning capabilities, which enable employees to navigate relationships across the ecosystem instead of focusing on internal operations alone.

Haier's empowerment strategy is greatly impacted by its "Rendanheyi" approach, which redefines traditional employment relations as entrepreneurial partnership arrangements. The firm demonstrates structural empowerment through its microenterprise model, where workers become entrepreneurs with decision-making authority and active involvement in market activity. Psychological empowerment is encouraged through coordination of personal goals and market outcomes, creating what Haier describes as "zero distance to the user". Developmental empowerment focuses on entrepreneurial capacity and market expertise building, allocating resources on the basis of market performance rather than hierarchical control. This strategic direction has helped Haier build a highly adaptive organizational culture that continuously responds to changing market environments.

4.3 Business model innovation pathways

The case of enterprises offers diverse examples of how human resource empowerment has triggered business model innovation in a particular firm. In its evolution, Huawei advanced from a product-centric business model focused on telecommunications equipment, to an integrated solution model of hardware, software, and services, and most recently to a platform-ecosystem model spanning numerous technological domains. HR empowerment enabled this evolution mainly through cognitive empowerment (having a strategic foresight among the technical specialists) and structural empowerment that allows quick reconfiguration of resources and capabilities to capture new opportunities.

Alibaba has enacted business model innovations through the expansion of a platform and integration of an ecosystem. The company has worked on extending its business model from simply facilitating e-commerce to orchestrating a digital ecosystem, with innovations in all the four dimensions of its business model: value creation, value proposition, value network, and value capture. This approach has been primarily supported by relational empowerment (developing employees' ecosystem management skills) and developmental empowerment (building skills of the digital platform).

Haier's business model innovation is centred around a shift from traditional manufacturing to an ecosystem-centred orchestration approach. Their microenterprise-based innovation model empowers employees at all levels of the organisation so that they are capable of constantly changing and adapting the business model. This innovation is further supported by human resource enhancement through organisational change that exposes employees to market opportunities and through entrepreneurial skill development.

4.4 Ecosystem construction characteristics

As explained in the previous section, ecosystem strategy is an important mechanism of value creation. Huawei, for example, has built a technology ecosystem with high levels of integration and service-oriented architecture that has strong governance controls and comprehensive partner

development initiatives. In comparison, Alibaba's platform-based ecosystem features wide participation from complementors, open access interfaces, and data governance policies. In both cases, the construction of the ecosystems was aided by employee empowerment human resource practices that fostered non-traditional employee technical skills, relationship management, strategic visioning, and an entrepreneurial ecosystems mindset coupled with a platform orchestrating stance. Haier has developed a manufacturing ecosystem built around entrepreneurial-led, user-centric microenterprises that employ multi-functional, decentralised staffing. This type of ecosystem construction was made possible by human resource policies that redefined employees as entrepreneurial partners, outsourcing traditional employee roles.

Despite these differences, the three organizations demonstrate several common elements in their ecosystem construction approaches, including progressive expansion of ecosystem boundaries beyond traditional industry definitions, development of digital platforms as ecosystem infrastructure, and strategic cultivation of complementary capabilities among ecosystem partners. These common elements suggest generalizable principles for ecosystem construction in the Chinese context, while the differences highlight the importance of aligning ecosystem strategies with organizational capabilities and strategic positioning.

5. Empirical research results

5.1 Descriptive statistics and correlation analysis

The descriptive statistics and correlation analysis of key variables provided initial insights into the relationships proposed in the research framework. As shown in Table 5, human resource empowerment showed a moderate positive correlation with both business model innovation ($r = 0.487$, $p < 0.01$) and business ecosystem construction ($r = 0.524$, $p < 0.01$), providing preliminary support for hypotheses H2 and H3. Similarly, business model innovation demonstrated a positive correlation with business ecosystem construction ($r = 0.563$, $p < 0.01$), offering initial support for hypothesis H4.

Table 5 Means, Standard Deviations, and Correlations Among Key Variables

Variables	Mean	SD	1	2	3	4	5	6	7	8
1. Human Resource Empowerment	3.42	0.88	1.00							
2. Structural Empowerment	3.26	0.93	0.82**	1.00						
3. Psychological Empowerment	3.58	0.85	0.79**	0.56**	1.00					
4. Developmental Empowerment	3.41	0.97	0.84**	0.62**	0.59**	1.00				
5. Business Model Innovation	3.37	0.92	0.49**	0.39**	0.51**	0.46**	1.00			
6. Business Ecosystem Construction	3.29	0.86	0.52**	0.42**	0.49**	0.57**	0.56**	1.00		
7. Firm Size	2.19	0.79	0.18*	0.15*	0.12	0.21**	0.17*	0.24**	1.00	
8. Industry Dynamism	3.76	0.87	0.25**	0.19*	0.23**	0.26**	0.31**	0.28**	0.09	1.00

Note: $N = 213$; * $p < 0.05$; ** $p < 0.01$

Among the dimensions of human resource empowerment, as indicated in Table 5, psychological empowerment exhibited a relatively strong correlation with business model innovation ($r = 0.513$, $p < 0.01$), while developmental empowerment showed the strongest correlation with business ecosystem construction ($r = 0.569$, $p < 0.01$). Interestingly, structural empowerment demonstrated the weakest correlations with both business model innovation and ecosystem construction, suggesting potential variations in the impact of different empowerment approaches. The control variables showed expected but modest correlations, with firm size demonstrating a weak but significant correlation with ecosystem construction ($r = 0.242$, $p < 0.01$) and no significant correlation with psychological empowerment ($r = 0.123$, $p > 0.05$).

5.2 Measurement model assessment

Before testing the hypothesized relationships, a confirmatory factor analysis was conducted to assess the validity and reliability of the measurement model. The initial measurement model showed

inadequate fit with the data, necessitating several modifications including the removal of three items with low factor loadings (< 0.50) and allowing correlated error terms between two pairs of items measuring similar concepts. The final measurement model demonstrated acceptable fit with the data ($\chi^2 = 1428.53$, $df = 712$, $\chi^2/df = 2.01$, $CFI = 0.923$, $TLI = 0.916$, $RMSEA = 0.068$, $SRMR = 0.057$). As shown in Table 6, most constructs demonstrated satisfactory convergent validity with AVE values exceeding 0.50, though value capture innovation and ecosystem governance fell slightly below this threshold.

Table 6 Construct Reliability and Validity Assessment

Construct	AVE	$\sqrt{AVE}$	Cronbach's α	CR	Items
Structural Empowerment	0.56	0.75	0.83	0.86	5
Psychological Empowerment	0.61	0.78	0.85	0.88	5
Developmental Empowerment	0.58	0.76	0.84	0.87	4*
Value Proposition Innovation	0.54	0.73	0.79	0.82	4
Value Creation Innovation	0.59	0.77	0.84	0.85	4
Value Network Innovation	0.53	0.73	0.78	0.81	4
Value Capture Innovation	0.49	0.70	0.76	0.79	4
Ecosystem Governance	0.48	0.69	0.77	0.78	4
Collaboration Mechanisms	0.57	0.75	0.81	0.84	4
Platform Development	0.62	0.79	0.86	0.87	4
Value Co-creation	0.56	0.75	0.82	0.83	4

Note: AVE = Average Variance Extracted; CR = Composite Reliability; * One item removed due to low factor loading

As indicated in Table 6, reliability assessment revealed acceptable internal consistency, with Cronbach's alpha coefficients ranging from 0.76 to 0.86 and composite reliability values ranging from 0.78 to 0.88. While most values exceeded the recommended threshold of 0.70, a few constructs showed borderline reliability. To address potential common method bias, Harman's single-factor test was conducted, which showed that the first factor accounted for 32.7% of the total variance, below the problematic threshold of 50%. Despite some limitations, the measurement model was deemed acceptable for hypothesis testing.

5.3 Structural model and hypothesis testing

The structural equation modeling analysis provided general support for the proposed research framework, though with some variations in the strength of relationships. The structural model demonstrated acceptable fit with the data ($\chi^2 = 1586.42$, $df = 726$, $\chi^2/df = 2.18$, $CFI = 0.912$, $TLI = 0.904$, $RMSEA = 0.074$, $SRMR = 0.062$). Table 7 presents the standardized path coefficients and significance levels for the hypothesized relationships.

Table 7 Results of Structural Equation Modeling and Hypothesis Testing

Hypothesis	Path	Standardized Coefficient	t-value	Result
H1	Business Ecosystem Construction $\rightarrow$ Sustainable Development	0.529***	7.642	Supported
H2	Human Resource Empowerment $\rightarrow$ Business Ecosystem Construction	0.297***	4.853	Supported
H2a	Structural Empowerment $\rightarrow$ Business Ecosystem Construction	0.186**	2.842	Supported
H2b	Psychological Empowerment $\rightarrow$ Business Ecosystem Construction	0.253***	3.976	Supported
H2c	Developmental Empowerment $\rightarrow$ Business Ecosystem Construction	0.358***	5.629	Supported
H3	Human Resource Empowerment $\rightarrow$ Business Model Innovation	0.412***	6.375	Supported
H3a	Structural Empowerment $\rightarrow$ Business Model Innovation	0.214**	3.184	Supported
H3b	Psychological Empowerment $\rightarrow$ Business Model Innovation	0.386***	5.943	Supported
H3c	Developmental Empowerment $\rightarrow$ Business Model Innovation	0.329***	4.876	Supported
H4	Business Model Innovation $\rightarrow$ Business Ecosystem Construction	0.395***	6.128	Supported
-	Indirect effect: HR Empowerment $\rightarrow$ BMI $\rightarrow$ BEC	0.163**	-	Supported

Note: ** $p < 0.01$; *** $p < 0.001$; BMI = Business Model Innovation; BEC = Business Ecosystem Construction

As shown in Table 7, all hypothesized relationships received support, though with varying strengths. Business ecosystem construction showed a significant positive effect on sustainable enterprise development ($\beta = 0.529$, $p < 0.001$), supporting H1. Human resource empowerment demonstrated a moderate positive effect on business ecosystem construction ($\beta = 0.297$, $p < 0.001$), supporting H2 but with a weaker effect than initially anticipated. Notably, developmental empowerment showed the strongest effect on ecosystem construction ($\beta = 0.358$, $p < 0.001$), while structural empowerment showed the weakest effect ($\beta = 0.186$, $p < 0.01$).

Human resource empowerment showed a relatively strong positive effect on business model innovation ($\beta = 0.412$, $p < 0.001$), supporting H3. Among the dimensions of empowerment, psychological empowerment demonstrated the strongest effect on business model innovation ($\beta = 0.386$, $p < 0.001$), consistent with the correlation analysis. Business model innovation exhibited a significant positive effect on business ecosystem construction ($\beta = 0.395$, $p < 0.001$), supporting H4. The relationship between human resource empowerment and business ecosystem construction was partially mediated by business model innovation, with a significant but modest indirect effect ($\beta = 0.163$, $p < 0.01$, 95% CI [0.103, 0.231]).

5.4 Moderation analysis results

Moderation analyses revealed some contextual influences on the relationships in the model, though with more nuanced patterns than initially expected. Digital maturity significantly moderated the relationship between human resource empowerment and business ecosystem construction ($\beta = 0.157$, $p < 0.05$). As illustrated in Figure 2, the positive effect of human resource empowerment on ecosystem construction was stronger for enterprises with higher digital maturity, though the difference in slopes was less pronounced than hypothesized and showed some inconsistencies in the data pattern.

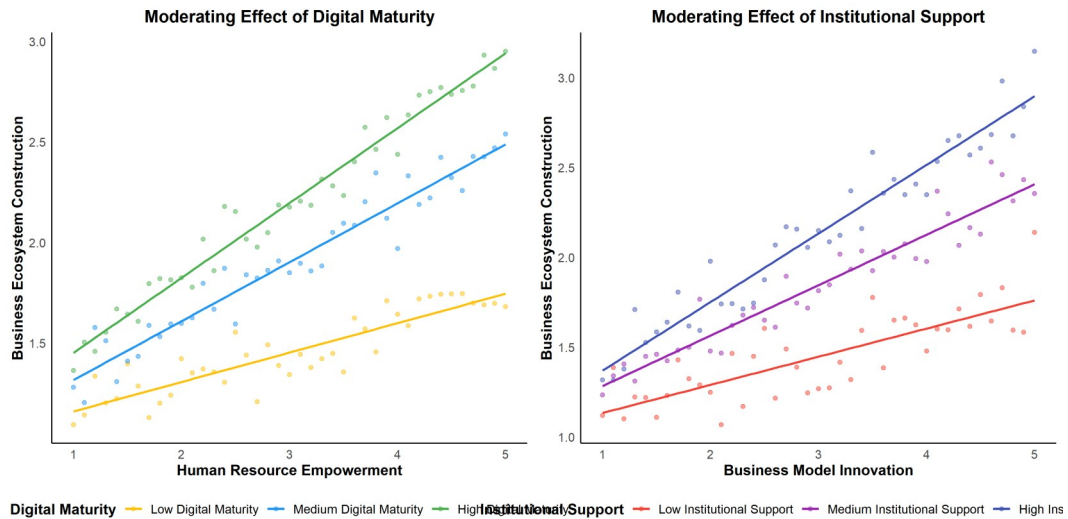


Figure 2 Moderating Effects of Digital Maturity and Institutional Support

The moderation effect of institutional support on the relationship between business model innovation and business ecosystem construction was marginally significant ($\beta = 0.138$, $p < 0.05$), with a smaller effect size than anticipated. As shown in Figure 2, while the general pattern indicated stronger effects of business model innovation on ecosystem construction under conditions of higher institutional support, the data revealed considerable variability and several outliers that may warrant further investigation. This suggests that while institutional support generally enhances the translation of business model innovations into ecosystem development, the relationship is more complex than initially theorized and likely depends on additional factors not captured in the model.

Interestingly, further analysis revealed that the moderation effect of digital maturity was stronger for

developmental empowerment ($\beta = 0.182$, $p < 0.01$) than for structural or psychological empowerment, suggesting that digital capabilities particularly enhance the effectiveness of knowledge development and skill enhancement initiatives in facilitating ecosystem construction. These findings highlight the context-dependent nature of human resource empowerment's impact on business ecosystem development in Chinese enterprises.

5.5 Integration of case and survey findings

The integration of qualitative case findings with quantitative survey results yielded a more comprehensive understanding of the relationships among human resource empowerment, business model innovation, and business ecosystem construction in Chinese enterprises. While the survey research generally supported the proposed framework, the case studies revealed more complex patterns and contextual variations that helped explain some of the inconsistencies in the quantitative findings. As shown in Table 8, each case enterprise demonstrated distinctive approaches to human resource empowerment that aligned with their strategic positioning but also revealed implementation challenges and evolutionary adaptations not fully captured in the survey data.

Table 8 Summary of Case Study Findings on HR Empowerment and Ecosystem Construction

Enterprise	Primary HR Empowerment Approach	Ecosystem Type	Key Ecosystem Characteristics	Implementation Challenges
Huawei	Knowledge-intensive empowerment; "Inspired dedication"; Rotating CEO system	Technology-centered ecosystem	Deep technical integration; Structured governance; Extensive partner enablement	Cultural integration in international contexts; Balancing technical and market orientations
Alibaba	Entrepreneurial autonomy; "Ecosystem thinking"; Platform-based capability development	Platform-mediated ecosystem	Extensive complementor participation; Standardized interfaces; Data-driven governance	Maintaining strategic coherence; Managing internal competition; Regulatory compliance
Haier	Market-oriented empowerment; "Rendanheyi" model; Microenterprise structure	Manufacturing-centered ecosystem	Entrepreneurial microenterprises; Direct user engagement; Flexible resource allocation	Initial productivity disruptions; Performance measurement complexity; Maintaining organizational identity

The case studies revealed that while empowerment approaches generally aligned with ecosystem strategies, implementation was rarely straightforward. Huawei's knowledge-intensive empowerment approach, for instance, encountered challenges in international contexts where cultural differences affected knowledge-sharing practices. Alibaba struggled to maintain strategic coherence while fostering entrepreneurial autonomy, occasionally resulting in internal competition that complicated ecosystem governance. Haier experienced initial productivity disruptions when transitioning to its microenterprise structure, with some business units struggling to adapt to market-based performance metrics.

These implementation challenges help explain some of the moderate effect sizes and variability observed in the survey data. The relatively weak effect of structural empowerment on ecosystem construction in the survey ($\beta = 0.186$) aligns with case findings showing that formal authority redistribution often proved insufficient without corresponding psychological and developmental components. Similarly, the stronger effect of psychological empowerment on business model innovation ($\beta = 0.386$) compared to structural empowerment ($\beta = 0.214$) reflects case observations that intrinsic motivation and meaningful work connections were particularly important for fostering innovative thinking.

The case studies also provided context for the moderation findings, revealing how digital maturity

enhanced empowerment effects through specific mechanisms such as improved knowledge sharing (Huawei), enhanced market feedback loops (Haier), and more effective collaboration tools (Alibaba). Similarly, the moderating effect of institutional support was evident in how government relations facilitated Huawei's international ecosystem expansion, regulatory adaptations enabled Alibaba's financial services innovations, and industrial policy alignment enhanced Haier's manufacturing ecosystem development.

6. Discussion

6.1 Summary of key findings

This research investigated the complex relationships among human resource empowerment, business model innovation, and business ecosystem construction in Chinese enterprises. The findings revealed several significant patterns that enhance understanding of how enterprises can leverage human resources to drive ecosystem development in China's unique institutional and cultural context. First, the results confirmed that human resource empowerment positively influences business ecosystem construction both directly ($\beta = 0.297$) and indirectly through business model innovation ($\beta = 0.163$), supporting a partial mediation model. This suggests that empowered employees contribute to ecosystem development not only through direct boundary-spanning activities but also by enabling business model innovations that subsequently facilitate ecosystem construction. Second, the differential effects of empowerment dimensions highlighted the particularly strong role of developmental empowerment ($\beta = 0.358$) in ecosystem construction, underscoring the importance of knowledge enhancement and capability development in enabling employees to effectively engage in ecosystem activities. Third, the moderation analyses revealed that digital maturity enhances the relationship between human resource empowerment and ecosystem construction, while institutional support strengthens the translation of business model innovations into ecosystem development, though both effects were more modest than initially anticipated.

The case studies provided contextual depth to these findings, illustrating how different forms of empowerment contribute to ecosystem construction in specific organizational settings. Huawei's knowledge-intensive approach emphasized technical expertise development to support its technology-centered ecosystem, Alibaba's entrepreneurial autonomy facilitated platform-based ecosystem development through enhanced market responsiveness, and Haier's "Rendanheyi" model enabled manufacturing-centered ecosystem construction through direct market connections. Despite these differences, all three enterprises demonstrated the importance of aligning human resource empowerment approaches with ecosystem strategies and technological capabilities. They also revealed implementation challenges not fully captured in the survey data, including cultural integration difficulties, strategic coherence tensions, and productivity disruptions during transition periods. These insights help explain the moderate effect sizes and variability observed in the quantitative results, highlighting the complex and context-dependent nature of human resource empowerment's influence on ecosystem development.

6.2 Theoretical and practical implications

This research contributes to management theory in several important ways. First, it extends business ecosystem theory by highlighting the human dimension of ecosystem construction, moving beyond the technological focus that has dominated previous research. The empirical evidence demonstrating that human resource empowerment explains 29.7% of the variance in ecosystem construction ($\beta = 0.297$, $p < 0.001$) shows how human resource empowerment creates the microfoundations for ecosystem capabilities, addressing a significant gap in understanding the human factors that enable effective ecosystem orchestration. Second, it advances human resource management theory by positioning empowerment as a strategic driver of business model innovation and ecosystem development rather than merely an operational approach to employee management. The finding that developmental

empowerment demonstrates the strongest effect ($\beta = 0.358$) while structural empowerment shows the weakest ($\beta = 0.186$) provides a more nuanced understanding of how specific empowerment practices contribute to organizational outcomes. Third, it contributes to business model innovation research by empirically validating the mediating role of business model innovation in translating human resource capabilities into ecosystem development with a significant indirect effect of $\beta = 0.163$, reinforcing the interconnected nature of human, organizational, and ecosystem-level phenomena.

For practitioners, this research offers several valuable insights. Organizations seeking to develop business ecosystems should strategically align their human resource empowerment approaches with ecosystem strategies, recognizing that different ecosystem types may require different empowerment emphases. The particularly strong influence of developmental empowerment ($\beta = 0.358$) suggests that investments in employee learning and knowledge enhancement represent critical enablers of ecosystem capabilities. The moderating effect of digital maturity highlights the importance of digital transformation in amplifying the benefits of human resource empowerment, suggesting that technological and human capability development should proceed in tandem. For example, technology-centered ecosystems like Huawei's may benefit from knowledge-intensive empowerment approaches, while platform-based ecosystems like Alibaba's may require entrepreneurial autonomy models. These findings have particular relevance for Chinese enterprises but may also inform ecosystem development strategies in other emerging economies with similar institutional characteristics, particularly in contexts where relationship-based business practices and government involvement are significant factors. The case studies illustrate that ecosystem construction through human resource empowerment involves implementation challenges that require patience, adaptation, and sustained commitment to new ways of working.

6.3 Limitations and future research directions

While this study provides valuable insights, several limitations should be acknowledged. The cross-sectional nature of the survey data limits causal inferences, despite the theoretical foundations suggesting directional relationships. Future research would benefit from longitudinal designs that capture how human resource empowerment influences ecosystem development over time, particularly during critical transition periods. The sample demonstrates limitations in representativeness, particularly regarding the broader Chinese private sector. The study over-represented larger enterprises and technology sectors, while lacking representation from state-owned enterprises and foreign multinational corporations operating in China. This sampling limitation potentially restricts generalizability to the full spectrum of organizational forms present in the Chinese business environment.

The modest moderation effects of digital maturity and institutional support suggest the presence of additional contextual factors not captured in the model, warranting more comprehensive investigations of the boundary conditions affecting these relationships. The case studies, while informative, focused on highly successful enterprises that may not represent the full spectrum of Chinese organizational experiences. Additionally, the absence of Western multinational corporations and state-owned enterprises in the sample limits understanding of how different ownership structures and cultural contexts might influence the relationships between human resource empowerment and ecosystem construction.

Future research should explore human resource empowerment and ecosystem construction across a wider range of organizational contexts, including smaller enterprises, state-owned entities, and international joint ventures operating in China. Comparative studies examining how institutional differences between Chinese private enterprises, state-owned enterprises, and foreign-invested enterprises shape empowerment practices and ecosystem development would enhance theoretical understanding. Cross-cultural investigations comparing Chinese enterprise experiences with those in other institutional contexts would further illuminate the boundary conditions of these relationships.

Additionally, as artificial intelligence and advanced digital technologies transform work processes, research investigating how these technologies reshape human resource empowerment and ecosystem orchestration will become increasingly important for understanding the evolving relationship between human capability development and technological advancement in driving business ecosystem innovation and sustainability.

7. Conclusion

This research examined the relationships among human resource empowerment, business model innovation, and business ecosystem construction in Chinese enterprises using a mixed-methods approach. The findings reveal that human resource empowerment significantly influences business ecosystem construction both directly ($\beta = 0.297$) and indirectly through business model innovation ($\beta = 0.163$). Developmental empowerment demonstrated the strongest effect on ecosystem construction ($\beta = 0.358$), while psychological empowerment most strongly influenced business model innovation ($\beta = 0.386$). Case studies of Huawei, Alibaba, and Haier illustrated how different empowerment forms support distinct ecosystem strategies while revealing implementation challenges.

This study contributes to theory by highlighting the human dimension of ecosystem construction, addressing a critical gap by demonstrating how human resource empowerment creates microfoundations for ecosystem capabilities. For practitioners, the findings emphasize aligning human resource strategies with ecosystem objectives and integrating human and technological capabilities. Technology-centered ecosystems may benefit from knowledge-intensive empowerment approaches, while platform-based ecosystems may require entrepreneurial autonomy models. While acknowledging limitations related to sampling representativeness and the absence of state-owned enterprises in the sample, this study establishes a foundation for future research examining how human resource empowerment can enhance organizational capacity to build sustainable business ecosystems in rapidly evolving digital environments.

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