

## Developing a Model for Creating Innovative Businesses with an Approach Integrating Artificial Intelligence, Metaverse, and Social Networks Using Structural Equation Modeling

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### ABSTRACT

The primary objective of this study was to propose a model for establishing innovative businesses through an integrative approach incorporating artificial intelligence, the metaverse, and social networks, utilizing structural equation modeling. This research employed a quantitative, developmental, and field-based methodology. The study population comprised all managers and experts from technology companies in Tehran, with a sample size of 386 participants determined accordingly. To assess the research variables, a researcher-designed questionnaire grounded in the extant literature was utilized. Its validity was evaluated via content validity, and reliability was confirmed through Cronbach's alpha coefficient. Structural equation modeling was applied to analyze the final model, with results obtained via AMOS software indicating that the validity of the proposed model was substantiated. The analysis results demonstrate that the components of innovative business models, informed by artificial intelligence, social networks, and the metaverse, encompass a set of key resources that play a pivotal role in the transformation and advancement of this domain. Software and hardware infrastructures serve as foundational elements for implementing emerging technologies such as artificial intelligence, virtual reality, and augmented reality.

**KEYWORDS:** Entrepreneurship, innovative businesses, artificial intelligence, metaverse, social networks

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## 1. Introduction

The rapid advancement of technology has ushered in a new era for businesses, characterized by the convergence of artificial intelligence (AI), the metaverse, and social networks (Mancuso et al., 2023). This paradigm shift presents unprecedented opportunities and challenges for both entrepreneurs and established enterprises alike (Anshari et al., 2022). To fully harness the potential of these technologies and navigate the dynamic landscape effectively, a model is needed to guide emerging businesses in their strategic approaches (Nalbant & Aydın, 2023). The primary problem this study addresses is the absence of a comprehensive framework that integrates AI, the metaverse, and social networks into a cohesive strategy for new ventures—a need that has increasingly become imperative given the growing applications of these concepts in business contexts.

Emerging businesses confront an increasingly complex environment in which traditional business models may prove insufficient for achieving optimal effectiveness (Connock, 2022). The integration of AI into business operations, the emergence of the metaverse as a new digital frontier, and the centrality of social networks in customer and partner engagement pose unique challenges for businesses in connecting with their target audiences and markets (Far et al., 2023). These technologies promise enhanced productivity, expanded reach, and immersive customer experiences, yet they also introduce risks and uncertainties. Without a clear model to guide their implementation, new businesses risk misallocating resources, missing opportunities, and vulnerability to technological disruptions (Kliestik et al., 2022).

Furthermore, evolving customer expectations and the swift adoption of technology-driven approaches by competitors across industries have elevated the development of innovative business models leveraging emerging technologies to a critical challenge and concern for managers (Cosenz et al., 2021).

Several unresolved and ambiguous aspects surround the integration of AI, the metaverse, and social networks within the business landscape (Schmitt, 2023). It remains unclear how emerging businesses can effectively leverage AI to enhance operations and decision-making. The metaverse, while promising, lacks established business models, and its impact on various industries is indeterminate (Benjamins et al., 2023). Moreover, the dynamics of social networks, including their evolving algorithms and the balance between organic and paid engagement (such as Google Ads and Meta Ads), are in constant flux (Permatasari, 2022). This study seeks to illuminate these uncertainties and provide clarity on matters pertaining to business model development.

In summary, this research will consider various related variables, including:

- **AI Integration:** The extent of AI integration in new ventures and its impact on efficiency, innovation, and customer engagement (Rathore, 2023).
- **Metaverse Functionality:** Strategies for entering and engaging with the metaverse, including virtual reality (VR) and augmented reality (AR) applications (Schmitt, 2023).

- **Social Network Dynamics:** The role of social networks in customer acquisition, brand building, and data-driven marketing (Schmitt, 2022).

In this context, companies operating in the technology sector continually encounter novel approaches in product development and market expansion, underscoring the ongoing necessity for managers to attend to innovative business models. Indeed, these firms, through the creation and development of novel products inherent to their operations, must align themselves with target markets via contemporary models—a process that partly involves adaptation to emerging technologies. This alignment can generate competitive advantages while simultaneously presenting cost-related and performance-based challenges for managers.

Given these considerations, the objective of this study is to develop a comprehensive model that guides emerging businesses in effectively integrating AI, the metaverse, and social networks into their operations and strategies. This model offers practical insights, best practices, and strategic frameworks to assist new ventures in navigating the rapidly evolving technological landscape. By addressing the unresolved and ambiguous facets of these technologies, the study aims to empower entrepreneurs and business leaders to make informed decisions and capitalize on opportunities in the digital age. Ultimately, this research contributes to the sustainability and success of emerging businesses in an AI-driven metaverse and interconnected social world. Accordingly, the primary research question is: What is the model for creating innovative businesses with an approach integrating artificial intelligence, the metaverse, and social networks?

## 2. Review of Theoretical Foundations and Research Background

### Development of New Small Businesses in Developing Economies

The existing literature on the development of new businesses in developing economies focuses on antecedents that influence their growth rates. Organizational positions and resource availability are major challenges that affect firm effectiveness, sales levels, and profitability (Wang & Mir, 2016). Changes in the growth of small businesses, considering their geographical context, are also linked to firm-related factors. Such factors include the level of formality, value chain linkages, and access to formal banking financial resources. Specifically, the lack of formal registration of a business has a negative association with its growth.

Informality causes a firm to limit its size to avoid visibility risks, thereby attracting legal enforcers. However, this business practice restricts firms from accessing formal support, which consequently limits their growth. Additionally, informal firms lack easy access to organized markets, financial institutions, and formal educational institutions. Williams (2014), using a study of cross-national variations among 38 emerging economies, emphasizes that the prevalence of informal business activities is associated with per capita gross domestic product levels, tax rates, social contribution levels, and poverty rates.

## **Newness and Smallness of a Business**

Since the liabilities of newness and smallness coexist, there is a need to conceptually differentiate between the two. Researchers describe the "newness" of a business as new roles and tasks that must be learned and invented, social interactions within the organization among strangers who lack a shared normative basis or informal information structure. Moreover, when an organization begins operations, stable links with customers, supporters, or clients are not established. Additionally, the term "new" in relation to age is associated with the amount of accumulated experience. The concept of "experience" corresponds to the extent of prior actual involvement in activities. As interaction increases, so does the accumulation of experience. Therefore, newness refers to the extent of a business's prior interaction with stakeholders and internal processes. Thus, aging and survival in absolute time are not synonymous (Aldrich & Ruef, 2006). There are also difficulties in distinguishing between "new" and "established" businesses. In the Global Entrepreneurship Monitor research, a project on entrepreneurship, the number of years of operation is used to differentiate between new and established businesses. Here, businesses that have been operational for three and a half years or less are categorized as new businesses, while those that have survived beyond this period are considered established businesses.

In this study, it is assumed that a new business begins with an intention accompanied by action, decision, or activity for product development, resource access, or stakeholder engagement, regardless of whether it operates in a formal or informal space. A new business begins with the founder's intention to launch the business, their actions to mobilize resources, when they start creating a boundary for the company such as formal registration, and begin exchanges with external parties. Therefore, new business refers to the time when the founder decides to leave their job and start their own work, when a team of founders agrees to start a business in accordance with the requirements for developing small and medium enterprises to acquire resources, or when a founder begins discussing with their parents for support in resources, for example, using part of the residence and its premises to launch a business.

## **The Role of Artificial Intelligence in Innovative Businesses**

In the rapidly evolving landscape of the business world, one phenomenon has emerged as a disruptive force reshaping industries and redefining traditional business models: artificial intelligence (AI). The integration of AI technologies has ushered in a new era for businesses, presenting unprecedented opportunities and challenges. This article explores the multifaceted impact of AI on new businesses, delving into how it influences operations, innovation, customer engagement, and the overall competitive landscape.

1. **Automation and Operational Efficiency** One of the most immediate and tangible impacts of AI on new businesses is the automation of routine and repetitive tasks. AI-based systems can perform data analysis, customer services, and administrative functions with speed and accuracy, freeing human resources to focus on more complex and strategic aspects of the business. This increase in operational efficiency leads to cost savings, improved productivity, and faster decision-making processes (Petropoulos, 2018). AI-driven automation is particularly beneficial in industries such as manufacturing, logistics, and customer services, where routine tasks can be seamlessly delegated to machines. This not only reduces the

likelihood of human error but also allows businesses to reallocate human talent to tasks requiring creativity, critical thinking, and emotional intelligence—areas where machines currently lack the nuance of human capabilities (Min, 2010).

2. **Innovation and Product Development** AI acts as a catalyst for innovation in new businesses. By leveraging machine learning algorithms, businesses can analyze vast amounts of data to identify trends, consumer preferences, and market gaps. This data-driven approach enables companies to make informed decisions about product development, tailor their offerings to meet specific customer needs, and stay ahead of competitors (Jahar & Pent, 2015). Startups and small businesses, in particular, benefit from AI tools that facilitate rapid prototyping, testing, and iteration of products. Virtual assistants and chatbots with natural language processing (NLP) enhance customer interactions, providing personalized and efficient services. This level of innovation not only improves product quality but also opens new avenues for revenue generation and market expansion (Pethokoukis, 2018).
3. **Customer Engagement and Personalization** AI revolutionizes how businesses interact with their customers. Through advanced analytics and machine learning, companies can gain valuable insights into customer behavior, preferences, and feedback. This information enables the creation of personalized customer experiences, tailored marketing campaigns, and targeted product recommendations (Petropoulos, 2018). Chatbots, virtual assistants, and AI-based customer support systems empower businesses to provide real-time assistance, improving overall customer satisfaction. Additionally, AI facilitates predictive analytics, enabling businesses to anticipate customer needs and preferences. As a result, customer engagement becomes more meaningful and personalized, fostering loyalty and long-term relationships (Jahar & Pent, 2015).
4. **Advanced Decision-Making with Data Analytics** The abundance of data generated in the digital age can be overwhelming for businesses. AI comes to the rescue by providing sophisticated data analytics tools that transform raw data into actionable insights. New businesses can harness the power of AI-driven analytics to make informed decisions, identify emerging trends, and adapt quickly to changing market conditions (Pethokoukis, 2018). Machine learning algorithms can analyze historical data to predict future trends, helping businesses develop proactive strategies. This data-driven decision-making not only reduces uncertainty but also enables businesses to optimize their operations, streamline processes, and allocate resources more effectively (Min, 2010).
5. **The Evolving Workforce: Collaboration Between Humans and Machines** While AI automates routine tasks, it also creates the need for a workforce equipped with skills necessary for effective collaboration with intelligent machines. New businesses must prioritize reskilling and upskilling their employees to navigate the evolving technological landscape. Roles requiring creativity, critical thinking, and emotional intelligence gain increasing value as AI takes over more routine functions (Jahar & Pent, 2015). Furthermore, AI contributes to the rise of the gig economy and remote work by facilitating automation of tasks that do not necessarily require physical presence. New businesses can tap into a global talent pool, leading to a more diverse and flexible workforce. However, it is crucial for organizations to

address the ethical implications of AI in the workforce and ensure fair practices and responsible use of technology (Min, 2010).

6. **Ethical Considerations and Responsible AI** As businesses increasingly integrate AI into their operations, ethical considerations become paramount. The responsible development and deployment of AI technologies require a commitment to transparency, fairness, and accountability. New businesses must prioritize ethical considerations to build trust with customers, employees, and the broader community (Pethokoukis, 2018). Issues such as bias in algorithms, data privacy, and the potential misuse of AI technologies raise ethical concerns that demand careful attention. By adopting ethical frameworks and ensuring transparency in AI decision-making processes, businesses can navigate these challenges and contribute to the responsible evolution of AI (Jahar & Pent, 2015).

The impact of AI on new businesses is profound and multifaceted. From automation and operational efficiency to innovation and customer engagement, AI is reshaping the business landscape in unprecedented ways. As businesses navigate this transformative journey, striking a balance between leveraging the benefits of AI and addressing ethical considerations is essential (Min, 2010). The evolving relationship between humans and machines necessitates a strategic approach to workforce development, emphasizing the cultivation of skills that complement AI capabilities. New businesses that embrace responsible AI practices, foster innovation, and prioritize customer-centric strategies will thrive in an era where adaptability and agility are key drivers of success.

### **The Role of the Metaverse in Innovative Businesses**

The emergence of the metaverse has ushered in a new era in the digital landscape, bringing profound implications for businesses across various industries. The metaverse, often defined as a collective virtual shared space created by the convergence of physical and virtual reality, is not merely a buzzword but a transformative force. As businesses grapple with the rapid evolution of technology, the metaverse presents both challenges and opportunities, altering how companies operate, engage with customers, and create value. In this exploration, we delve into the multifaceted impact of the metaverse on new business ventures and how entrepreneurs navigate this uncharted territory.

1. **Redefining Customer Engagement** One of the most significant impacts of the metaverse on new businesses is the redefinition of the customer engagement landscape. Businesses, traditionally limited to websites and social media platforms, can now interact with customers in immersive virtual environments. Virtual reality (VR) and augmented reality (AR) technologies enable businesses to create lifelike simulations where customers can explore products, services, and experiences in ways previously unimaginable. This shift enhances customer engagement, allowing for deeper connections between businesses and their target audiences (Daikoku, 2022).
2. **Evolution of E-Commerce** The metaverse revolutionizes the e-commerce landscape by offering a more interactive and personalized shopping experience. Virtual storefronts and immersive shopping environments in the metaverse empower customers to explore products in

three-dimensional spaces, virtually try them on, and make informed purchasing decisions. This transformation in e-commerce is not limited to retail; service-oriented businesses are also exploring ways to leverage the metaverse to enhance their offerings, from virtual consultations to immersive experiences (Rissam, 2022).

3. **Decentralized Finance (DeFi) and Cryptocurrency Integration** As the metaverse expands, decentralized finance (DeFi) and cryptocurrencies are becoming integral components of the digital economy. Blockchain technology, the backbone of cryptocurrencies, ensures secure and transparent transactions in the metaverse. Smart contracts, powered by blockchain, facilitate automated and trustless agreements, streamlining various aspects of business operations. Entrepreneurs are increasingly exploring the potential of integrating cryptocurrencies and DeFi principles to create new business models in the metaverse (Traders & Warchf, 2022).
4. **Collaborative Workspaces and Remote Teams** The metaverse has the potential to redefine how businesses operate, particularly in the context of remote work and collaborative efforts. Virtual offices and collaborative workspaces in the metaverse provide teams with a shared environment, overcoming the limitations of physical distance. Businesses can conduct meetings, workshops, and collaborative projects in immersive virtual settings, fostering a sense of presence and collaboration that transcends geographical boundaries (Daikoku, 2022).
5. **New Revenue Streams** The metaverse offers businesses novel ways to generate revenue beyond traditional models. Virtual real estate, digital assets, and non-fungible tokens (NFTs) are emerging as lucrative opportunities. Entrepreneurs can monetize virtual spaces, create and sell digital assets, and use blockchain technology to tokenize unique creations. This diversification of revenue streams provides greater resilience and adaptability in the face of changing market dynamics.
6. **Advanced Marketing and Branding** Marketing strategies in the metaverse are evolving, providing businesses with innovative ways to build and promote their brands. Virtual events, influencer collaborations in virtual spaces, and immersive advertising campaigns empower businesses to connect with audiences in novel ways. The metaverse offers a dynamic and interactive canvas for storytelling, allowing brands to create memorable experiences that resonate with their target demographics (Rissam, 2022).
7. **Challenges and Considerations** While the metaverse presents unprecedented opportunities, businesses must navigate the inherent challenges of this evolving landscape. Concerns related to privacy, security issues, and the need for standardized protocols are critical considerations. Additionally, the digital divide and accessibility issues must be addressed to ensure inclusivity in the metaverse-driven business ecosystem (Daikoku, 2022).

The metaverse is not just a futuristic concept; it is a current reality reshaping the business landscape. New ventures must adapt to the evolving nature of the digital frontier, or risk falling behind. As the metaverse continues to grow, businesses that embrace innovation, leverage emerging technologies, and prioritize customer experiences will position themselves at the forefront of this transition (Traders & Warchf, 2022).

## The Role of Social Networks in Innovative Businesses

In the digital age, social media has emerged as a powerful force reshaping the business landscape. Its influence extends across various sectors, with new businesses particularly affected. This section explores the multifaceted impact of social media on new businesses, delving into the opportunities and challenges it presents.

### Opportunities for New Businesses

1. **Visibility and Brand Awareness** Social media platforms provide an unparalleled opportunity for new businesses to enhance their visibility and brand awareness. Through strategic use of platforms like Instagram, Facebook, Twitter, and LinkedIn, businesses can reach global audiences without requiring substantial marketing budgets. Effective social media presence helps build brand identity and attract potential customers (Spencer, 2019).
2. **Targeted Marketing and Advertising** Social media platforms offer sophisticated targeting options, allowing new businesses to tailor their marketing efforts to specific demographics. Through data analytics and user insights, businesses can create personalized and targeted advertisements, ensuring their content reaches the most relevant audiences. This targeted approach can significantly improve conversion rates and return on investment (Mahmoud & Tsvir, 2013).
3. **Customer Engagement and Interaction** Social media facilitates direct communication between businesses and their customers. This interaction can be invaluable for new businesses seeking to understand customer preferences, gather feedback, and build a loyal customer base. Real-time engagement through comments, direct messages, and polls enables businesses to quickly adapt to changing market demands and improve their products or services accordingly (Bruun & Brewe, 2013).
4. **Market Research and Trend Analysis** Social media serves as a treasure trove of data that can be utilized for market research and trend analysis. By monitoring conversations, tracking hashtags, and analyzing user behavior, new businesses can gain insights into market trends, competitor strategies, and consumer sentiments. This information is crucial for making informed business decisions and staying competitive in the market.

### Challenges Facing New Businesses

1. **Intense Competition and Saturation** While social media provides a level playing field for businesses, it also contributes to intense competition and market saturation. For new businesses, standing out amid the vast sea of content is challenging, requiring them to invest time and resources in creating compelling and unique content that resonates with their target audiences (Spencer, 2019).
2. **Algorithm Changes and Reduced Organic Reach** Social media platforms frequently update their algorithms, impacting the organic reach of business content. New businesses may struggle with decreased visibility, especially if they rely solely on organic methods. This

necessitates a dynamic approach, requiring businesses to stay informed about algorithm changes and adapt their strategies accordingly (Mahmoud & Tsvir, 2013).

3. **Managing Negative Publicity and Reputation** The interconnected nature of social media means that negative feedback or public relations crises can escalate quickly. New businesses must be vigilant in managing their online reputation, promptly addressing customer concerns and handling negative comments. Failure to do so can lead to long-term damage to a brand's image (Bruun & Brewé, 2013).
4. **Dependency on Platform Policies** New businesses are subject to the policies and regulations of the social media platforms they use. Changes in these policies, such as shifts in advertising guidelines or content restrictions, can significantly impact a business's strategy and performance. Adaptability is key in navigating this challenge.

In conclusion, the impact of social media on new businesses is complex, presenting both opportunities and challenges. While social media provides cost-effective tools for brand promotion, targeted marketing, and customer engagement, it also requires strategic adaptation to evolving algorithms, intense competition, and potential reputation risks. To thrive in the digital age, new businesses must leverage the opportunities offered by social media while addressing the challenges and ensuring a balanced and resilient online presence. As technology continues to evolve, the role of social media in shaping the business landscape will undoubtedly evolve, requiring businesses to remain agile and innovative in their approach (Spencer, 2019). Based on the review of the examined concepts and the research background, the dimensions and components of the innovative business model are presented in Table 1:

**Table 1: Main Components and Variables of the Innovative Business Model**

Row	Variable Title	Corresponding Concepts	Sources
1	<b>Key Partners</b>	<ul style="list-style-type: none"> <li>• Identifying new key partners</li> <li>• Establishing connections with new key partners</li> <li>• Creating strategic collaborations with new key partners</li> <li>• Connecting with technology developers</li> <li>• Connecting with industry specialists</li> <li>• Connecting with business partners</li> <li>• Connecting with industry influencers</li> </ul>	Mankaso et al., 2023; Nalban & Aydın, 2023; Farr et al., 2023; Smith, 2023; Scalfoni & Oliveira, 2021
2	<b>Key Activities</b>	<ul style="list-style-type: none"> <li>• Modern marketing resources</li> <li>• Smart human resources attraction</li> <li>• Flexible resource analysis</li> <li>• Big data analysis</li> <li>• Continuous innovation services</li> <li>• Modern customer services</li> <li>• Agile operations management</li> </ul>	Nalban & Aydın, 2023; Konuk, 2022; Kasenz et al., 2021; Permatasari et al., 2022; Wang, 2016; Wright & Schultz, 2018; Farhadi & Esfahani, 2022
3	<b>Key Resources</b>	<ul style="list-style-type: none"> <li>• Software infrastructure</li> <li>• Hardware infrastructure</li> <li>• Emerging technologies</li> </ul>	Mankaso et al., 2023; Konuk, 2022; Klestik et al., 2022; Smith, 2023

Row	Variable Title	Corresponding Concepts	Sources
		<ul style="list-style-type: none"> <li>• Social networks and communications</li> <li>• Knowledge and information management</li> <li>• Human resources and training</li> </ul>	
4	<b>Cost Structure and Revenue Streams</b>	<ul style="list-style-type: none"> <li>• Technology development costs</li> <li>• New knowledge development costs</li> <li>• Continuous research and development costs</li> <li>• Agile production costs</li> <li>• Direct sales revenues</li> <li>• Revenues from new solutions</li> </ul>	Nalban & Aydın, 2023; Farr et al., 2023; Klestik et al., 2022
5	<b>Customer Relationships</b>	<ul style="list-style-type: none"> <li>• Modern customer relationship methods</li> <li>• Customer relationships through social networks</li> <li>• Customer relationships through metaverse</li> </ul>	Nalban & Aydın, 2023; Farr et al., 2023; Klestik et al., 2022; Kasenz et al., 2021; Permatasari et al., 2022
6	<b>Channels</b>	<ul style="list-style-type: none"> <li>• Multiple communication platforms</li> <li>• AI-powered customer support</li> <li>• Social networks</li> </ul>	Nalban & Aydın, 2023; Farr et al., 2023; Klestik et al., 2022
7	<b>Customer Segments</b>	<ul style="list-style-type: none"> <li>• Startup companies</li> <li>• Companies active in metaverse</li> <li>• Social network customers</li> <li>• Customers needing AI services</li> <li>• Technology-driven companies</li> <li>• Large technology companies</li> <li>• Small and medium service companies</li> <li>• Small and medium manufacturing companies</li> </ul>	Mankaso et al., 2023; Konuk, 2022; Farr et al., 2023; Kasenz et al., 2021; Smith, 2023; Scalfoni & Oliveira, 2021

### 3. Research Methodology

To distinguish and analyze phenomena related to organizations and management issues, including human resources, marketing, accounting, and other similar areas, the researcher implicitly considers fundamental philosophical perspectives as the foundation for conceptual understanding of cognition and, based on this foundation, decides on the selection of research methods. This study emphasizes the positivist paradigm. Furthermore, this research is applied in nature, as its primary objective is to understand a new business model incorporating modern technologies and to present a model for implementing this concept in modern business systems, which can be introduced as applied research. In the theoretical section, library studies were utilized for data collection. In this section, articles, books, and theses related to the research topic are evaluated. Additionally, in the field study section, questionnaires were used as the data collection tool. The validity of this questionnaire was assessed through content validity, and its reliability was evaluated using Cronbach's Alpha coefficient, which was calculated at 0.87, indicating acceptable reliability of the research instrument. All managers and experts from technology companies in Tehran Province constitute the research population. Cluster sampling method was employed, and the sample size was determined using Cochran's formula for finite populations at 386 individuals. To statistically examine the model fit, first- and second-order

confirmatory factor analysis within the framework of structural equation modeling was utilized. The software used in this research was AMOS.

#### 4. Data Analysis Results

##### Examination of the Final Designed Model Fit

In examining the structural model, path analysis was conducted to investigate the relationships between constructs, and through this process, the research model fit was tested. Initially, the structural diagram of the extracted model is presented in the figure below:

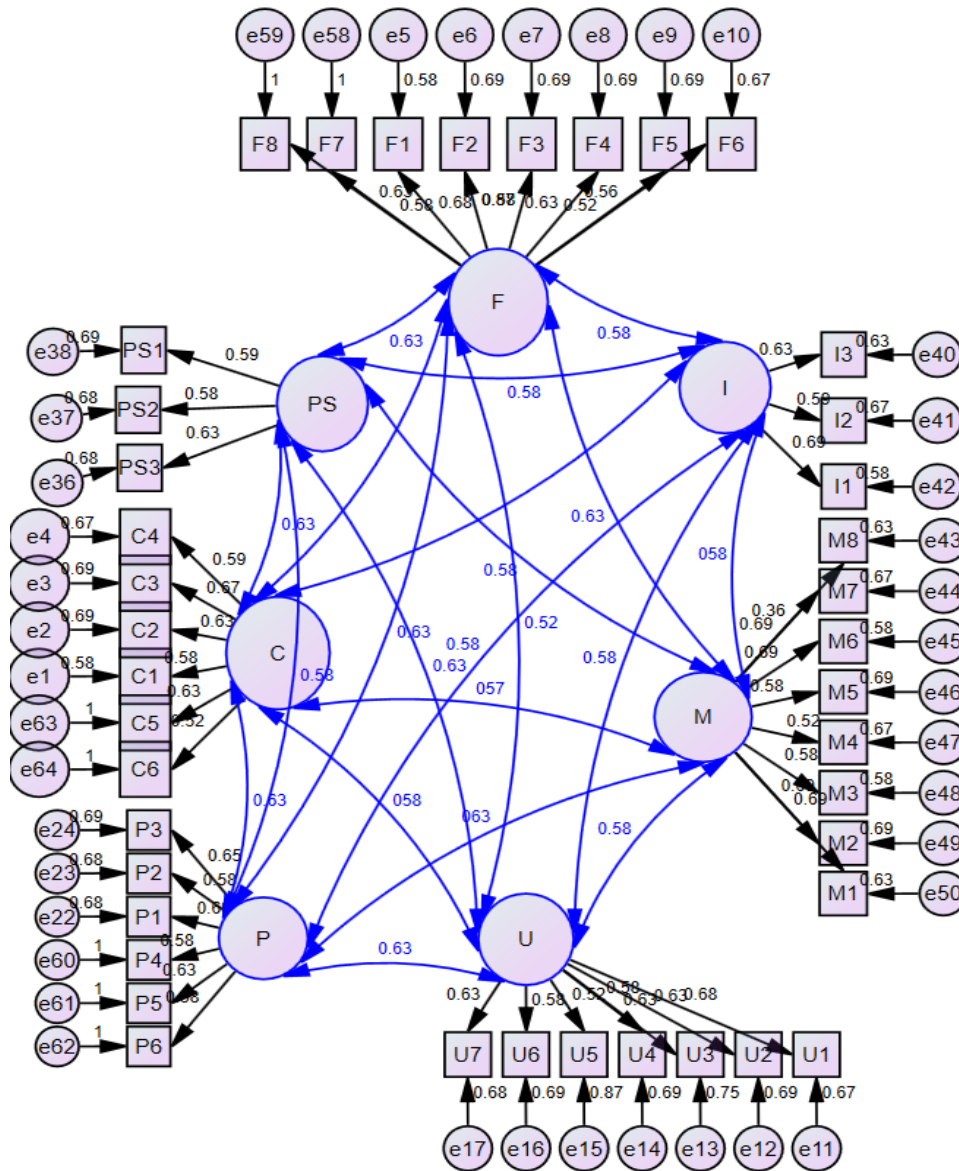


Figure 1: Fitted Measurement Model (First-Order Confirmatory Factor Analysis) Based on Standardized Coefficients

### Examination of the Final Designed Model Fit

As shown in this figure, the final conceptual model of the research, which is derived from the components and indicators identified in the previous stage (qualitative analysis), has been depicted using AMOS software. The oval shapes represent the main indicators, while the rectangular shapes represent the identified components. Additionally, the numbers on each line indicate the factor loadings. Accordingly, this model has been analyzed to examine the final model fit from a quantitative perspective and from the viewpoint of users.

**Table 2: Model Fit Indices**

Index	Value	Status
TLI	0.902	Confirmed
NFI	0.946	Confirmed
IFI	0.953	Confirmed
CFI	0.952	Confirmed
$\chi^2/df$	2.890	Confirmed
GFI	0.970	Confirmed
RMSEA	0.062	Confirmed
RMR	0.052	Confirmed

The summary of the results examining the relationships between the research components is presented in the following table:

**Table 3: Summary of Results from the Measurement Model (First-Order Factor Analysis)**

Main Indicator	Model Indicators	Factor Loading	Critical Ratio	Composite Reliability	AVE
Cost-Revenue Structure (C)	C1	0.58	5.416	0.85	0.62
	C2	0.63	6.081		
	C3	0.61	7.789		
	C4	0.66	8.986		
	C5	0.65	11.101		
	C6	0.67	9.416		
Key Partners (F)	F1	0.68	9.602	0.74	0.58
	F2	0.59	12.913		
	F3	0.62	9.600		
	F4	0.53	11.652		
	F5	0.65	11.101		
	F6	0.67	9.416		
	F7	0.61	12.750		
	F8	0.54	7.266		
Key Activities (U)	U1	0.5	10.304	0.82	0.61
	U2	0.60	8.882		

Main Indicator	Model Indicators	Factor Loading	Critical Ratio	Composite Reliability	AVE
	U3	0.55	7.276		
	U4	0.65	9.097		
	U5	0.58	7.932		
	U6	0.59	10.456		
	U7	0.52	8.851		
Key Resources (P)	P1	0.69	8.800	0.81	0.56
	P2	0.58	6.75		
	P3	0.54	6.371		
	P4	0.65	9.097		
	P5	0.58	7.932		
	P6	0.65	9.097		
Customer Relationships (PS)	PS1	0.59	5.45	0.72	0.65
	PS2	0.58	5.12		
	PS3	0.63	6.186		
Channels (I)	I1	0.69	7.752	0.71	0.54
	I2	0.55	6.066		
	I3	0.54	6.371		
Customer Segments (M)	M1	0.5	10.304	0.83	0.62
	M2	0.60	8.882		
	M3	0.55	7.276		
	M4	0.65	9.097		
	M5	0.58	7.932		
	M6	0.59	10.456		
	M7	0.52	8.851		
	M8	0.65	9.097		

In the second stage, using the average of the sub-indicators and calculating the main indicators of the model at the second level, the model was depicted and calculations were performed accordingly. The results of this analysis are presented in the figure below:

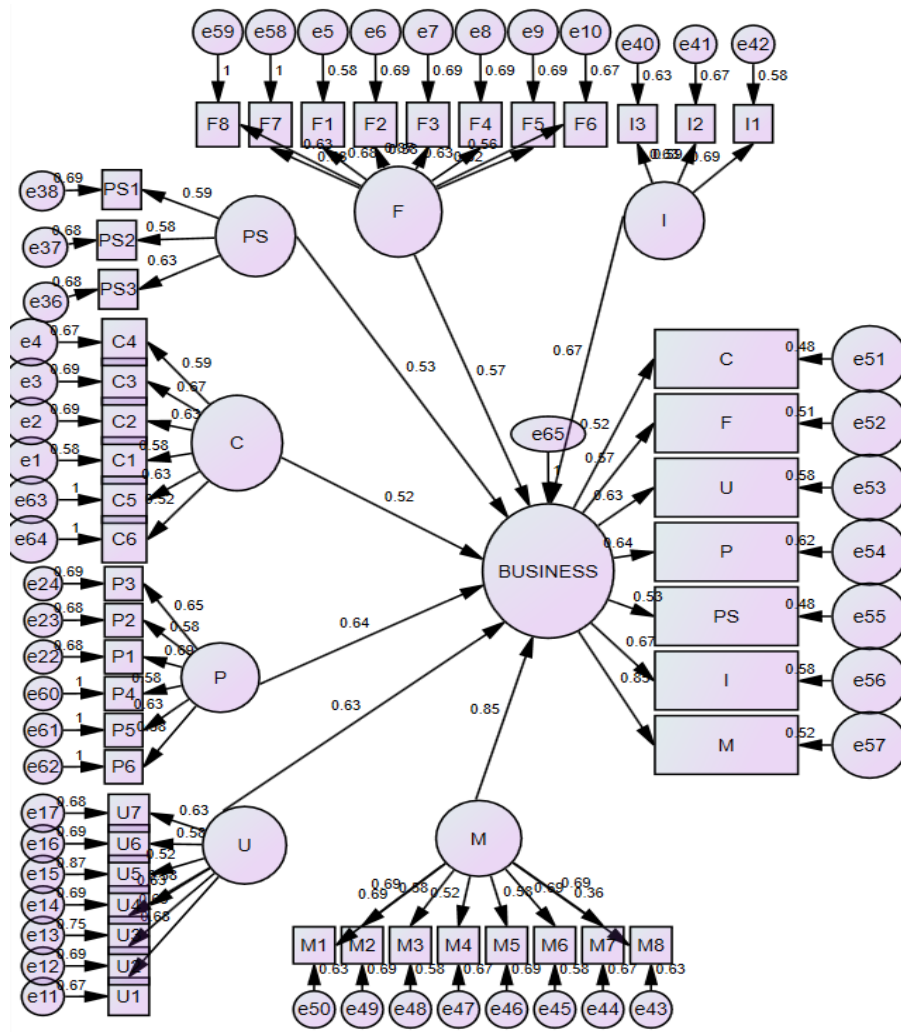


Figure 2: Fitted Measurement Model (Second-Order Confirmatory Factor Analysis) Based on Standardized Coefficients

Table 4: Confirmatory Factor Analysis of Consumer Behavior Model in Social Networks

Symbol	Components	Factor Loading	Critical Ratio	Significance Level	Status
C	Key Partners	0.52	6.12	0.001	Confirmed
F	Key Activities	0.57	6.18	0.001	Confirmed
U	Key Resources	0.63	7.12	0.001	Confirmed
P	Cost-Revenue Structures	0.64	7.13	0.001	Confirmed
PS	Customer Relationships	0.53	6.14	0.001	Confirmed
I	Channels	0.67	8.25	0.002	Confirmed
M	Customer Segments	0.85	9.14	0.001	Confirmed

As shown in the above table, the examination of the relationship between all components and main indicators presents the provided factor loadings. These values, when calculated above 0.3,

indicate the existence of a relationship between latent and observed components. As evident in this table, all relationships between latent and observed variables are confirmed. Additionally, the results of examining the model fit are presented in the following table:

**Table 5: Model Fit Indices**

Index	Value	Status
TLI	-	Confirmed
NFI	0.98	Confirmed
IFI	0.98	Confirmed
CFI	0.94	Confirmed
$\chi^2/df$	2.59	Confirmed
GFI	0.98	Confirmed
RMSEA	0.044	Confirmed
RMR	0.000	Confirmed

As evident in the above table, all examined indices are at an appropriate fit level. Therefore, it can be stated that the final model fit is also statistically confirmed. Based on the above table, two indices—RMSEA at 0.044 and  $\chi^2/df$  at 2.59—have been calculated, both of which are within acceptable standards. All other fit indices have also been calculated above 0.9, and this standard indicates the model fit under examination. Therefore, it can be stated that the model identified in the qualitative section has also been confirmed from the consumers' perspective. Additionally, the correlation coefficient between criteria is presented in Table 6:

**Table 6: Correlation between Criteria**

Components	Key Partners	Activities	Key Resources	Cost-Income Structure	Customer Relationships	Channels	Customer Segments
Key Partners	1	0.54	0.52	0.48	0.62	0.57	0.42
Key Activities		1	0.54	0.58	0.54	0.52	0.57
Key Resources			1	0.56	0.52	0.59	0.62
Cost-Revenue Structures				1	0.48	0.49	0.52
Customer Relationships					1	0.75	0.56
Channels						1	0.42
Customer Segments							1

## 5. Discussion and Conclusion

The indicators and subcomponents of the innovative business model with an approach to artificial intelligence, social networks, and the metaverse have been identified, including key partners, technology developers, industry experts, business partners, and industry influencers.

The importance of key partners in the success of a business is exceptionally high. These key partners can be new entities that add value to the business through novel capabilities and resources. Establishing connections with these new partners via social networks and other communication methods provides opportunities for exchanging information, experiences, and resources. Furthermore, forging strategic collaborations with these new partners fosters enduring and sustainable relationships that can contribute to the development and growth of the business. In addition to key partners, connections with technology developers are equally critical. These developers can enhance business performance and competitiveness by providing cutting-edge technologies and upgrading products and services. Moreover, engaging with industry experts, business partners, and industry influencers facilitates collaborations, knowledge exchange, and the creation of new opportunities, which are invaluable for business advancement and progress.

Key partners in the innovative business model, oriented toward artificial intelligence, social networks, and the metaverse, hold paramount importance. Identifying new key partners—particularly individuals and companies active in emerging technologies and artificial intelligence—enables greater progress and development for organizations. Establishing connections with these new key partners not only facilitates the exchange of information and experiences but also generates opportunities for collaboration and the sharing of resources and knowledge. Developing strategic collaborations with these key partners can support sustainable growth and enhanced organizational competitiveness, while introducing novel capabilities across various functions of the business model. Additionally, connections with technology developers, industry experts, and business partners are of high significance. Such linkages can create new avenues for innovation and technological improvement, leading to the emergence of fresh business opportunities and increased productivity in operational processes. Furthermore, interactions with industry influencers—including prominent executives, leading researchers, and representatives of major organizations—can assist organizations in aligning with industry trends and changes, thereby capitalizing on emerging opportunities.

The components of the innovative business model, with an approach to artificial intelligence, social networks, and the metaverse, encompass a set of key resources that play a vital role in the transformation and advancement of this domain. Software and hardware infrastructure serve as the foundational base for implementing emerging technologies such as artificial intelligence, virtual reality, and augmented reality. These infrastructures include servers, storage systems, high-speed communication networks, and specialized software that enable the processing of large and complex datasets. Moreover, emerging technologies like artificial intelligence, the Internet of Things (IoT), and blockchain contribute to the development of innovative services and products applicable in metaverse virtual environments and social networks. On the other hand, social networks and communications function as bridges connecting users and businesses. Knowledge and information management is of utmost importance, as generated data and information must be efficiently managed, analyzed, and utilized to inform strategic decision-making. Skilled human resources and continuous training are essential for optimal utilization of these technologies and infrastructures. Cultivating human capital with requisite skills in emerging technologies and data management enables businesses to rapidly adapt to market changes and customer needs, thereby achieving success in the contemporary competitive landscape.

Innovative businesses oriented toward artificial intelligence, social networks, and the metaverse require substantial investments across various domains. The cost structures of these businesses comprise multiple components, with technology development costs being among the most critical. These costs encompass the acquisition and maintenance of advanced hardware, complex software, and the establishment of necessary infrastructures for deploying artificial intelligence and metaverse technologies. In addition, costs associated with developing novel knowledge constitute a significant portion, including employee training, ongoing skill updates, and the recruitment of domain-specific experts. Furthermore, continuous research and development costs are pivotal for enhancing and innovating products and services, involving research projects, iterative testing, and the creation of new prototypes. Agile production costs, which emphasize the business's ability to respond swiftly to market shifts and customer demands, include the adoption of modern production methods and the optimization of manufacturing processes. In contrast to these costs, innovative businesses derive revenue from multiple streams. Direct sales revenues represent a primary source, obtained through the sale of products and services to customers. These revenues may include sales of software, hardware, and other physical and digital products. Moreover, revenues from innovative solutions form a substantial segment, encompassing subscription-based models, customized services, digital advertising on social networks and the metaverse, as well as the sale of content and virtual experiences on metaverse platforms. These innovative approaches allow businesses to generate sustainable and diversified revenues by delivering unique experiences and added value to customers.

In innovative business models, customer relationships have undergone transformation through novel customer engagement methods. One such method involves leveraging artificial intelligence to analyze customer data and deliver personalized experiences. Artificial intelligence can autonomously respond to customer inquiries, predict their needs, and offer tailored recommendations. This technology can also identify customer behavior patterns and refine marketing strategies accordingly. This degree of automation and personalization not only elevates customer satisfaction but also enhances business efficiency. Social networks and the metaverse provide powerful tools for customer engagement. Social networks enable businesses to interact directly and in real-time with customers, gather feedback, and address their requests and concerns. Such interactions can foster increased customer loyalty and stronger relational bonds. Conversely, the metaverse allows businesses to create interactive virtual environments for customers, where they can virtually explore products, engage with sales representatives via avatars, and experience richer, more immersive purchasing journeys. These novel customer engagement methods facilitate deeper and more enduring interactions. Communication channels in innovative businesses include multichannel platforms that permit businesses to connect with customers through diverse and varied means. These platforms may encompass websites, mobile applications, email, live chat, and various messaging services. Offering services across multiple channels enables businesses to address diverse customer needs and preferences, maintaining connectivity at any time and location. This multichannel approach improves the customer experience and simplifies access to information and services.

Customer support utilizing artificial intelligence constitutes another key element in modern communication channels. AI tools, such as chatbots and virtual assistants, can autonomously answer customer queries, resolve issues, and provide necessary information promptly. These

technologies can operate 24/7, delivering efficient and effective support without human intervention. Additionally, social networks serve as a crucial communication channel in innovative businesses. Beyond enabling direct interactions and feedback collection, social networks offer opportunities for advertising, marketing, and brand awareness enhancement. Through these channels, businesses can actively engage with their customer communities and cultivate more enduring relationships.

In innovative business models, customers are segmented into various categories, each with distinct needs and characteristics. Startup companies, as one customer segment, seek innovative and cost-effective solutions for rapid development and growth. These entities often require flexible and scalable services, such as cloud computing, technology consulting, and digital marketing tools. Companies operating in the metaverse represent a specific customer segment pursuing unique virtual experiences for their users. These firms demand advanced virtual and augmented reality technologies, 3D environment design tools, and virtual interaction platforms. Social network customers, comprising individual users and businesses, seek solutions to enhance social interactions, effective advertising, and improved audience communication management. These customers typically require data analytics tools, content management systems, and advertising campaign optimization features. Customers needing artificial intelligence services include diverse companies aiming to streamline processes, boost efficiency, and provide personalized experiences to their clientele. These may utilize chatbots, recommendation systems, big data analytics, and process automation. Technology-driven companies and large tech enterprises pursue advanced solutions for managing complexities and innovations, including cloud computing, cybersecurity, IoT, and blockchain services. Finally, small and medium-sized service and manufacturing companies seek solutions to enhance productivity, reduce costs, and improve product and service quality. These entities may require business management software, production automation tools, and customer support services.

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Authenticity of the texts, honesty and fidelity has been observed.

#### **CONFLICT OF INTEREST**

Author/s confirmed no conflict of interest.