

A Conceptual Development of Digital Trade Adoption among Manufacturing Companies in China: A Technology Acceptance Model Approach

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ABSTRACT

The proliferation of digital technologies has brought about transformative changes in various sectors, including manufacturing. In the context of China, a prominent manufacturing hub, the adoption of digital trade practices has emerged as a critical determinant of competitiveness and sustainability for manufacturing companies. This paper proposes a conceptual framework for understanding the factors influencing the adoption of digital trade among manufacturing firms in China, employing the Technology Acceptance Model (TAM) as a theoretical lens. Drawing upon extant literature and empirical insights, this conceptual paper identifies key constructs within the TAM framework, such as perceived usefulness, perceived ease of use, attitude toward digital trade, and behavioral intention, and adapts them to the specific context of digital trade adoption in the Chinese manufacturing sector. It explores how factors such as organizational readiness, technological infrastructure, government policies, and cultural factors influence the perceived usefulness and ease of use of digital trade platforms among manufacturing companies in China. Moreover, this paper extends the traditional TAM model by incorporating additional constructs such as trust in technology, perceived risk, and organizational innovativeness, which are deemed essential in understanding the complexities of digital trade adoption in a rapidly evolving technological landscape. It underscores the significance of trust-building mechanisms, risk mitigation strategies, and organizational culture in facilitating the successful implementation of digital trade initiatives within manufacturing enterprises in China. The proposed conceptual framework contributes to both theoretical and practical understandings of digital trade adoption by elucidating the interplay between technological factors, organizational dynamics, and contextual influences within the Chinese manufacturing context. By offering insights into the determinants of digital trade adoption and the mechanisms for enhancing acceptance and utilization of digital trade platforms, this paper aims to inform policymakers, industry practitioners, and scholars engaged in the promotion and facilitation of digital transformation within the manufacturing sector in China and beyond.

Keywords: digital trade practices, Technology Acceptance Model, digitalization, manufacturing sector

I. INTRODUCTION

Digital trade has emerged as a crucial aspect of global commerce, particularly impacting manufacturing companies in China, a significant player in the global supply chain. With the rapid advancement of digital technologies, manufacturing firms in China are increasingly leveraging digital trade platforms to streamline their operations, enhance efficiency, and expand their market reach. These platforms facilitate various aspects of trade, including online procurement, supply chain management, e-commerce, and digital payment systems. For instance, Alibaba's platforms, such as Alibaba.com and Tmall, have become integral channels for Chinese manufacturing companies to connect with global buyers and sell their products internationally (Zhang & Zhu, 2020). Moreover, digital trade enables Chinese manufacturers to overcome traditional trade barriers, such as geographical distance and language barriers, by providing real-time communication and transaction capabilities through digital channels. Despite the evident benefits, challenges persist, including concerns related to data security, regulatory compliance, and technological infrastructure. Therefore, understanding the implications of digital trade on manufacturing companies in China requires a multidimensional analysis that considers both the opportunities and challenges associated with digitalization in the context of global trade dynamics.

Research on the adoption of digital trade among manufacturing companies in China has made significant strides in recent years, yet several notable gaps persist in the literature. While existing studies have examined various aspects of digital trade adoption, including its benefits, challenges, and determinants, there remains a dearth of research specifically focused on the nuanced factors influencing adoption within the Chinese manufacturing context. For instance, while studies have explored the role of organizational readiness and technological infrastructure in digital trade adoption (e.g., [1]), there is limited empirical evidence on how government policies and regulatory frameworks shape the adoption patterns of manufacturing firms in China. Furthermore, the cultural dimensions of digital trade adoption, such as trust in technology and risk perceptions, have received relatively less attention in the literature, despite their significance in shaping organizational attitudes and behaviors toward digital trade platforms. Therefore, future research should aim to address these gaps by conducting empirical investigations that delve deeper into the contextual nuances and organizational dynamics influencing digital trade adoption among manufacturing companies in China.

The adoption of digital trade platforms among manufacturing companies in China presents a multifaceted problem that warrants careful examination. Despite the growing significance of digitalization in global commerce, several challenges hinder the widespread adoption of digital trade practices within the Chinese manufacturing sector. One critical issue stems from the lack of comprehensive understanding regarding the factors influencing digital trade adoption among manufacturing firms in China. While studies have explored various determinants such as organizational readiness, technological infrastructure, and government policies (Zhang & Zhu, 2020), there remains a gap in knowledge regarding the nuanced interplay of these factors within the Chinese manufacturing

context. Moreover, concerns related to data security, privacy, and intellectual property protection pose significant barriers to digital trade adoption among Chinese manufacturers, particularly in light of increasing cyber threats and regulatory uncertainties. Additionally, the fragmented nature of digital trade ecosystems and the proliferation of competing platforms further complicate adoption decisions for manufacturing companies. Therefore, elucidating the specific challenges and barriers hindering the adoption of digital trade platforms among manufacturing firms in China is essential for devising effective strategies to promote digitalization and enhance the competitiveness of the manufacturing sector in the global marketplace.

II. LITERATURE REVIEW

A. Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a widely recognized theoretical framework developed to understand and predict individuals' acceptance and usage of new information technologies. Originating from the field of information systems and behavioral science, TAM posits that an individual's intention to use a technology is determined by two primary factors: perceived usefulness (PU) and perceived ease of use (PEOU) (Davis, 1989). Perceived usefulness refers to the degree to which an individual believes that using a particular technology will enhance their performance or productivity, while perceived ease of use refers to the extent to which an individual perceives the technology as being effortless to use. These two beliefs influence an individual's attitude toward using the technology, which in turn shapes their intention to adopt it. TAM proposes that attitude and intention are key predictors of actual technology usage behavior.

TAM has been widely applied across various domains to study the adoption and use of technologies, including e-commerce platforms, mobile applications, social media platforms, and enterprise software systems. Researchers have extended the original TAM framework by incorporating additional variables to enhance its explanatory power, such as perceived enjoyment, social influence, and facilitating conditions. Additionally, TAM has been adapted to different cultural contexts and organizational settings, making it a versatile and robust model for understanding technology adoption behavior.

B. Digital Trade

Digital trade, often referred to as e-commerce or electronic commerce, encompasses the exchange of goods, services, and information conducted over digital platforms and networks. This modern form of trade leverages technologies such as the internet, mobile applications, and electronic data interchange (EDI) to facilitate transactions between businesses, consumers, and other entities. Digital trade includes a wide range of activities, such as online retailing, digital marketing, electronic payments, supply chain management, and cross-border trade conducted through digital platforms. With the increasing digitization of economies worldwide, digital trade has become a significant driver of economic growth, innovation, and globalization. It offers numerous advantages, including expanded market access, cost efficiencies, greater reach, and enhanced customer experiences. However,

digital trade also presents challenges related to regulatory frameworks, cybersecurity, data privacy, and bridging the digital divide. Understanding the intricacies of digital trade is essential for policymakers, businesses, and stakeholders to harness its potential benefits while addressing associated risks and ensuring inclusive and sustainable development.

The underpinning theory for understanding digital trade adoption often revolves around the Technology Acceptance Model (TAM), which provides a framework to explore individuals' intentions and behaviors toward adopting new technologies. TAM posits that perceived usefulness and perceived ease of use are key determinants of individuals' attitudes and intentions to use a technology (Davis, 1989). In the context of digital trade adoption among manufacturing companies in China, TAM can offer valuable insights into the factors influencing decision-making processes regarding the adoption of digital trade platforms. For instance, perceived usefulness may relate to how companies perceive the benefits of digital trade, such as increased market access, efficiency gains, and cost savings. Perceived ease of use, on the other hand, may reflect the extent to which companies perceive digital trade platforms as user-friendly and compatible with their existing systems and processes. By applying TAM, researchers can examine how these perceptions, along with other factors such as organizational readiness, technological infrastructure, and regulatory environments, shape the adoption of digital trade among manufacturing companies in China.

III. CONCEPTUAL DEVELOPMENT

The adoption of digital trade among manufacturing companies in China can be understood through various theoretical frameworks, one of which is the Innovation Diffusion Theory (IDT). IDT, proposed by Everett Rogers in 1962, elucidates how new innovations or technologies are adopted and diffused within a social system over time (Rogers, 1962). In the context of digital trade adoption, IDT suggests that the decision-making process of manufacturing firms in China is influenced by factors such as perceived attributes of the innovation, communication channels, social networks, and the extent of innovation-decision among the potential adopters. For instance, the perceived relative advantage of digital trade, such as cost savings and market expansion, may motivate manufacturing firms to adopt digital trade platforms. Additionally, the presence of opinion leaders within the industry and the dissemination of information through various communication channels can accelerate the adoption process. Moreover, the compatibility of digital trade with existing business practices and the trialability and observability of its benefits can also impact adoption decisions. By employing IDT, researchers can gain insights into the dynamics of digital trade adoption among manufacturing companies in China and identify strategies to facilitate its diffusion across the industry.

The conceptual development of digital trade adoption among manufacturing companies in China can be effectively analyzed through the lens of the Technology Acceptance Model (TAM). TAM provides a comprehensive framework for understanding the factors influencing individuals' intentions and behaviors toward adopting new technologies. In the context of digital trade adoption, TAM posits that perceived usefulness and perceived ease of use are key determinants of individuals' attitudes and intentions to use digital trade platforms

(Davis, 1989). Specifically, manufacturing companies in China may perceive digital trade platforms as useful for expanding market reach, optimizing supply chain processes, and enhancing competitiveness in the global market. Moreover, the ease of use of these platforms, such as user-friendly interfaces and seamless integration with existing systems, can further facilitate their adoption among manufacturing firms. By applying TAM, researchers can identify critical factors influencing digital trade adoption among manufacturing companies in China, develop targeted interventions to promote adoption, and enhance the effectiveness of digital trade initiatives within the manufacturing sector.

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