

Mechanisms and Pathways of AI-Enabled Evidence-Based Business Model Innovation in Cultural Tourism Enterprises

Sihan Lv*, Kaoxun Chi

Business School, Shandong University of Technology, Zibo, Shandong, China

**Corresponding Author*

Abstract: In the digital intelligence era, cultural tourism enterprises can effectively promote their high-quality development by engaging in evidence-based business model innovation (EBBMI). Artificial intelligence (AI) plays a significantly enabling role in this process. However, current research offers limited insight into the mechanisms and pathways through which AI enables EBBMI in cultural tourism enterprises. To address this gap, this study draws on the principles of evidence-based decision-making to develop a theoretical research framework that delineates the underlying mechanisms and pathways of AI-enabled EBBMI. This framework holds heuristic value for advancing theoretical research on the “AI+” initiative within the cultural tourism enterprise sector.

Keywords: Artificial Intelligence; Cultural Tourism Enterprises; Evidence-Based Business Model Innovation; Mechanism; Pathway.

1. Problem Statement

Artificial intelligence (AI) is a technology that governments consider as one of the strategies that can define the next-generation development. The cultural tourism sector can be considered as the most important field in this initiative. Enabling evidence-based business model innovation (EBBMI) is a vital trend within this domain. EBBMI means the business model innovation based on the best available evidence. Some cultural tourism companies have started to actively apply AI to introduce EBBMI. They do it to develop their well-developed development. An example of this would be the Dongping Lake Cultural Tourism Group of Shandong Province which employs smart tourism big data to offer accurate and professional services which are highly effective in streamlining the operations. Nevertheless, these uses are increasingly

showing possible AI threats such as data bias and value bias. These threats put into question the validity and credibility of the evidence. Consequently, an important question arises: What is the right way in which cultural tourism organizations should utilize their AI to perform evidence-based business model innovation? This question is relevant to both academic and practice.

The current research fills this gap by implementing the evidence-based decision-making principle of cross-validating multiple evidence sources with different values. This paper aims at increasing the level of standardization as well as effectiveness of the concept of the use of AI in cultural tourism companies by investigating the mechanisms and pathways in which AI can facilitate the development of EBBMI in such a company.

2. Literature Review

A systematic review reveals no studies directly examining our focal topic. Instead, relevant contributions appear across several distinct streams, which we synthesize below.

2.1 Research on AI-Enabled Managerial Decision-Making

Scholarly inquiry into artificial intelligence began in the 1950s. After alternating periods of progress and stagnation, AI has reemerged as a central focus of innovation over the past decade. This resurgence is driven by data explosion and advances in computational power. Relevant research clusters around three areas. Enabling technologies. Scholars initially focused on big data and machine learning. More recently, researchers advocate for improving model interpretability through explainable AI. Application domains. Prior work examined AI deployment in marketing, risk management, product inspection, and related fields [1]. Recent studies increasingly turn to more complex and strategic domains, such as AI-enabled business

model innovation and organizational innovation. Enabling processes. Researchers introduced algorithmic decision-making and analyzed its underlying processes [2]. In recent years, scholars have identified problems such as data bias and value bias in algorithmic decisions. They thus advocate human-machine collaborative decision-making as a mitigating approach [3,4].

2.2 Research on Evidence-Based Business Model Innovation (EBBMI)

EBBMI—which stands for evidence-based business model innovation—draws on the principles of evidence-based decision-making, denoting innovation activities rooted in the most reliable available evidence. Even though this specific term has not been formally introduced in earlier research, numerous studies have followed an “evidence→innovation” reasoning, thereby leaving a distinct evidence-informed signature on their work. The relevant literature falls into three main streams. First, for antecedent identification, scholars investigate how tangible evidence—such as falling profit margins or preferential policies—influences business model innovation [4]. Second, regarding prototype design, other contributions explore the mechanisms by which companies gather evidence through boundary-spanning search and knowledge integration, subsequently using that evidence to design BMI prototypes [5,6]. Third, for prototype adaptation, a further line of research examines how organizations supplement their initial evidence base via performance assessments and trial-and-error learning, which in turn allows them to refine their BMI prototypes [7,8]. More recently, attention has shifted toward the ways in which big data and AI facilitate BMI; specifically, these technologies supply digitized evidence related to value creation, value delivery, and value capture.

2.3 Research on AI-Enabled Business Model Innovation

AI-enabled business model innovation (BMI) has emerged as a new research domain over the past five years. Current studies cluster around three areas. Innovation content. AI can comprehensively enable innovation across the three core modules of a business model: value creation, value delivery, and value capture. For example, through AI-driven data analytics, firms

can more accurately detect product quality issues and identify customer needs. Innovation mechanisms. Some researchers adopt a capability-based perspective to examine how AI capabilities shape BMI mechanisms [9]. Other studies analyze how AI enables knowledge management activities—such as information collection and knowledge accumulation—thereby facilitating BMI. Antecedents. Scholars primarily investigate internal organizational factors, including corporate culture, organizational structure, technological capabilities, data resources, and top management team capabilities and knowledge endowments.

Taken together, prior studies have preliminarily explored AI-enabled BMI and AI-enabled managerial decision-making. However, they remain unable to adequately explain the focal phenomenon of this research. We identify three critical gaps.

First, existing research has not grounded AI application in the evidence-based decision-making framework. Consequently, while scholars acknowledge the potential risks of AI-enabled decision-making, neither theory nor practice has developed a reliable understanding of sound enabling logics and methods. Second, firms express strong demand for systematic approaches to evidence-based business model innovation. Yet current research fails to unpack the black box of the underlying process mechanisms. This limits the practical actionability of its conclusions. Third, evidence-based practice with AI involves multiple interdependent components. The enabling effects on business model innovation are highly complex. The lack of research addressing this complexity prevents scholars from comprehensively identifying feasible pathways for AI-enabled evidence-based business model innovation.

3. Research Framework

3.1 Overall Research Design

3.1.1 Research objectives

This study pursues four interconnected objectives. (1) To analyze the functions and interactive relationships among three core elements of evidence-based decision-making—evidence, values, and technology. Based on this analysis, we systematically construct a theoretical framework

for AI-enabled evidence-based business model innovation (EBBMI). (2) To introduce the evidence-based decision-making perspective into the study of business model innovation processes. In doing so, we provide direction and methodological insights for more disciplined and effective use of data. These insights help rationalize BMI decisions in the era of information overload. (3) To examine the enabling role of AI in business model innovation under the guidance of evidence-based decision-making. This examination aims to mitigate potential risks such as data bias and algorithmic discrimination. (4) To propose feasible pathways for AI-enabled EBBMI in cultural tourism enterprises. We ground these pathways in the TOE (Technology–Organization–Environment)

framework.

3.1.2 Research subjects

This study focuses on cultural tourism enterprises. We will select research subjects primarily from two sources: national-level civilized tourism demonstration units and provincial leading tourism enterprises (e.g., the “100 Leading Enterprises” cultivation program for cultural tourism enterprises in Shandong Province). We will further supplement the sample by identifying suitable enterprises from lists of provincial-level or higher cultural industry associations and cultural tourism industry alliances.

3.1.3 Research model

This study will structure its research content following the research model illustrated in Figure 1.

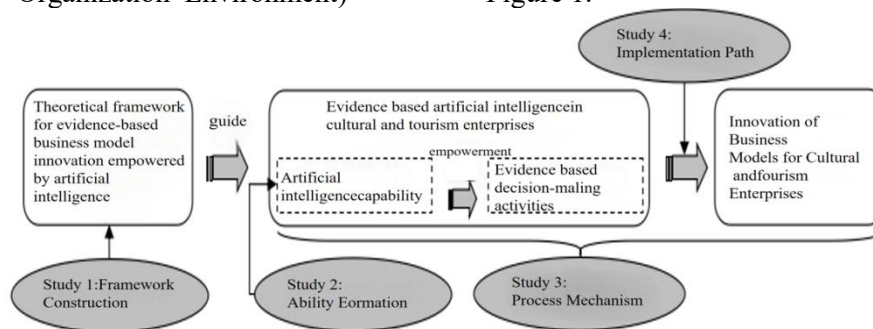


Figure 1. Research Model

3.2 Study 1: Constructing a Theoretical Framework for AI-Enabled Evidence-Based Business Model Innovation

3.2.1. Analyzing the logic of conventional evidence-based business model innovation

We build on the core “evidence–value” dyad of traditional evidence-based decision-making (Moulton, 2009). Using literature review and expert interviews, we examine the primary functions of evidence and value in business model innovation decisions. We then draw on Herbert Simon’s conceptualization of decision-making processes. This allows us to investigate how evidence and value interact along the following sequence: problem identification → solution design and implementation → outcome evaluation and adjustment. Specifically, we focus on two mechanisms—constraint and guidance. Through these mechanisms, we delineate the logic of conventional evidence-based business model innovation that balances factual rationality with value rationality.

3.2.2 Revealing the logic of AI-enabled

evidence-based business model innovation

Grounded in the conventional logic framework above, we also draw on Brian Arthur’s theoretical exposition on the nature of technology. First, we analyze how AI enables the evidence stream through three functions: evidence generation, evidence use, and evidence iteration. Simultaneously, we examine how AI enables the value stream through value sensing, value computation, and value management. Next, we theoretically discuss algorithmic risks inherent in AI-enabled innovation and propose strategies to mitigate them. Through these steps, we systematically reveal the logic of AI-enabled evidence-based business model innovation.

3.2.3 Constructing the theoretical framework

Synthesizing the above findings, we develop a theoretical framework for AI-enabled evidence-based business model innovation. The framework comprises three dimensions: fact formation (evidence), value attribution (value), and technology enablement (AI). This framework will guide subsequent studies in this research.

3.3 Study 2: The Formation Mechanism of AI Capabilities in Cultural Tourism Enterprises

3.3.1 Revealing the formation mechanism of AI capabilities in cultural tourism enterprises

Grounded in the “drivers–actions–outcomes” analytical framework, and drawing on the perspectives of Li et al. [10] and Mikalef & Gupta [11], we adopt case study research and grounded theory methods to exploratorily analyze how cultural tourism enterprises develop three types of AI capabilities—infrastructure, skills, and organizational management—through resource orchestration activities driven by internal and external factors. Based on this analysis, we construct a theoretical framework of the formation mechanism of AI capabilities in cultural tourism enterprises and develop corresponding theoretical propositions.

3.3.2 Empirically testing the formation mechanism of AI capabilities in cultural tourism enterprises

Building on the above findings, we further adapt measurement approaches for resource orchestration and AI capabilities from Shan et al., Mikalef et al. [11], and others. Using questionnaire surveys and statistical analysis, we collect large-sample data to empirically test the theoretical propositions derived from the case study.

3.4 Study 3: The Mechanism of AI-Enabled Evidence-Based Business Model Innovation in Cultural Tourism Enterprises

3.4.1 Phasing the evidence-based business model innovation process in cultural tourism enterprises

Grounded in the “problem identification – solution design – outcome evaluation” process of evidence-based decision-making, and drawing on the research perspectives of Geissdoerfer et al. [12], Ji et al., and others on antecedents, prototyping, and trial-and-error learning in business model innovation, we adopt case study and grounded theory methods to differentiate the BMI processes of sample enterprises into three evidence-informed stages: problem identification, prototype design, and adjustment and improvement.

3.4.2 Analyzing the mechanism of AI-enabled evidence-based business model innovation in cultural tourism enterprises

Building on theoretical perspectives—including the three-dimensional framework of AI-enabled evidence-based practice (fact formation, value

attribution, technology enablement), the knowledge-based view, and taxonomies of business model innovation [13] — we focus separately on strategic, focal, and disruptive types of BMI. Using case study and grounded theory methods, we examine how sample enterprises, at different stages of BMI, employ both conventional approaches and AI technologies (e.g., natural language processing, machine learning) to: (a) acquire, evaluate, and balance evidence and value claims, and (b) use evidence-based knowledge to formulate plans and ultimately make BMI decisions. Through comparative analysis across the three BMI types, we construct a theoretical framework of the mechanism by which AI enables evidence-based business model innovation in cultural tourism enterprises.

3.5 Study 4: Pathways and Strategies for AI-Enabled Evidence-Based Business Model Innovation in Cultural Tourism Enterprises

3.5.1 Necessary conditions for AI-enabled evidence-based business model innovation

Grounded in the TOE (Technology–Organization–Environment) analytical framework, we measure antecedent variables that influence BMI in cultural tourism enterprises—such as the level of evidence-based decision-making and AI capabilities—by adapting existing validated scales or developing new ones. Subsequently, focusing separately on strategic, focal, and disruptive types of BMI, we employ Necessary Condition Analysis (NCA) to examine the necessary conditions for AI-enabled evidence-based factors to drive BMI in cultural tourism enterprises. This analysis answers two questions: “Which AI-based evidence factors constitute necessary conditions for BMI in cultural tourism enterprises?” and “To what extent do these factors act as bottlenecks?”

3.5.2 Configurational pathways for AI-enabled evidence-based business model innovation

Grounded in the TOE framework, we measure antecedent variables affecting BMI—including evidence-based decision-making level, AI capabilities, and policy support—by adapting existing scales or developing new ones. Then, focusing separately on strategic, focal, and disruptive BMI types, we apply fuzzy-set Qualitative Comparative Analysis (fsQCA) to identify antecedent configurations that lead to a high degree of BMI. This approach reveals the multiple causal pathways through which

AI-based evidence factors enable BMI in cultural tourism enterprises. Finally, we classify sample enterprises by basic attributes such as industry subsector, region, and asset size, and compare the core AI-based evidence conditions and configurational pathways that enhance BMI levels across different enterprise types.

3.5.3 Strategies for AI-enabled evidence-based business model innovation

Synthesizing the above findings, we conduct a literature review and expert interviews. We

identify and synthesize both successful experiences and remaining problems in AI-enabled evidence-based BMI. On this basis, we propose strategic recommendations. These recommendations aim to improve the enabling effectiveness of AI for evidence-based business model innovation in cultural tourism enterprises. Integrating the analyses above, this study constructs the theoretical research framework shown in Figure 2.

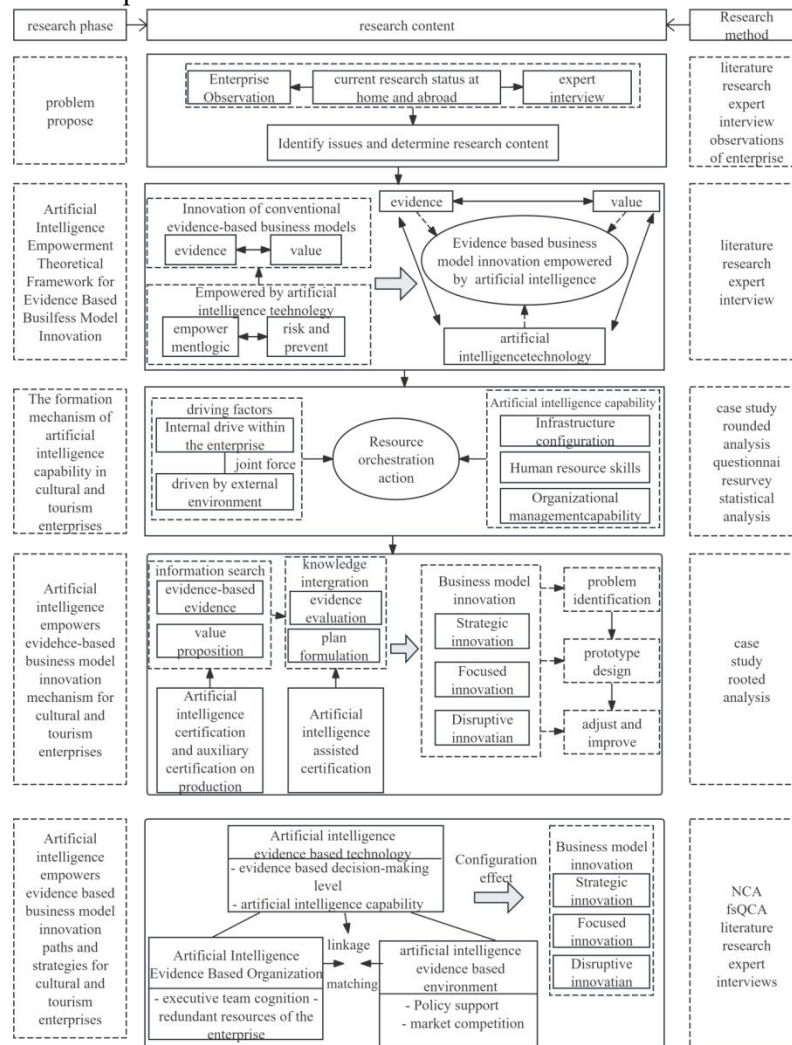


Figure 2. Theoretical Research Framework

4. Theoretical Contributions and Research Value

4.1 Theoretical Contributions

The process of AI-enabled evidence-based business model innovation (EBBMI) in cultural tourism enterprises is driven by three interconnected elements—evidence, values, and technology—each of which carries rich conceptual, as do the relationships among them.

Consequently, our research design enables an in-depth analysis of the underlying mechanisms of AI-enabled EBBMI. Moreover, because AI-enabled evidence-based practice constitutes a classic multi-factor, complex system problem in its influence on BMI in cultural tourism enterprises, our design further allows us to systematically reveal the configurational pathways through which such practice shapes BMI.

Accordingly, this study makes four primary

theoretical contributions.

Revealing the formation mechanism of AI capabilities in cultural tourism enterprises based on resource orchestration theory. Building AI capabilities serves as a prerequisite for firms to effectively leverage AI technologies. Prior research has not adequately answered the question of how AI capabilities form. To address this gap, this study draws on resource orchestration theory to uncover the formation mechanism of AI capabilities in cultural tourism enterprises.

Exploring the mechanism of AI-enabled evidence-based business model innovation (EBBMI) in cultural tourism enterprises from an evidence-based decision-making perspective. Little prior work has investigated how artificial intelligence can support innovation in a rule-based, transparent fashion, nor have existing studies provided adequate countermeasures for curbing AI-induced risks—such as decision biases or value prejudices. By anchoring our analysis in evidence-based decision-making as a conceptual foundation for promoting disciplined AI deployment, this research dissects the inner workings of AI-enabled EBBMI within cultural tourism firms. In doing so, it paves new pathways for the responsible adoption of AI technologies.

Clarifying the pathways that lead to AI-enabled EBBMI in cultural tourism enterprises. Multiple factors shape the enabling function of AI, yet a systematic examination of these influences remains absent from the current literature. This research addresses this gap by holistically considering technological, organizational, and environmental elements, thereby mapping out the routes through which AI facilitates EBBMI. Furthermore, adopting a configurational lens, we employ two emerging quantitative techniques—Necessary Condition Analysis (NCA) and fuzzy-set Qualitative Comparative Analysis (fsQCA)—to untangle the complex causal relationships in which multiple, simultaneous AI-related factors jointly foster EBBMI. This methodological choice not only sets our work apart but also enhances its originality.

4.2 Research Value

Theoretically speaking, this work can provide three main contributions. First of all, the suggested theoretical framework of

AI-empowered evidence-based business model innovation (EBBMI) extends the current BMI knowledge system to digital settings by adding the evidence-based decision-making lens into the research of business model innovation. Secondly, the identification of the manner in which AI capabilities are developed in cultural tourism organizations is pushing the limits of the resource orchestration theory into the sphere of AI management. The third contribution is that the detailed description of mechanisms and pathways in AI-enabled EBBMI helps us expand our theoretical understanding of the complex relationship between artificial intelligence and business model innovation.

In practice, the present study offers practical information. The suggested practices of developing AI capabilities, the stage-differentiated approach to evidence-based BMI, and the configurational pathways based on TOE can be used as specific operational instructions and managerial reference points by managers in cultural tourism companies. Such results allow companies to utilize AI technologies in a controlled, principled way and to increase the efficacy of business model innovation within the framework of the "AI+" initiative.

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