Extensive Scholarship and Perseverance: A Study of Jing Jipeng's Academic Thought on Information Ecology (Postprint)

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Abstract

[Purpose/Significance] To systematically review Mr. Jing Jipeng's information ecology thought, outline the general framework of his academic thought edifice, and enable future generations to fully comprehend the essence of his information ecology thought. [Method/Process] By collecting and studying Mr. Jing Jipeng's published works in the field of information ecology, relevant high-level academic papers, and interviews with him, his information ecology thought is divided into four stages: accumulation of information ecology thought, preliminary establishment of information ecology thought, formation of information ecology theoretical system, and the deepening development of information ecology thought. [Result/Conclusion] Summarizing Mr. Jing's contributions to information ecology thought from two aspects: theoretical system and educational system, and generalizing four main characteristics of his information ecology thought: innovativeness, forward-looking perspective, timeliness, and sustainability. Mr. Jing's information ecology thought has enriched the information science education system and promoted the development of information science education in China.

Full Text

Erudite and Persevering: A Study of Mr. Jing Jipeng's Academic Thought on Information Ecology

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Abstract: *[Purpose/Significance]* This paper systematically examines Mr. Jing Jipeng's information ecology thought, outlining the overall architecture of his academic contributions to enable future generations to fully grasp the essence

of his ideas. *[Method/Process]* Through collecting and studying Mr. Jing's published works and high-level academic papers in information ecology, as well as conducting interviews with him, his information ecology thought is divided into four stages: thought accumulation, initial establishment, theoretical system formation, and in-depth development. *[Result/Conclusion]* This paper summarizes Mr. Jing's contributions to information ecology from both theoretical and educational perspectives, and identifies four main characteristics of his thought: innovation, foresight, epochal nature, and sustainable development. Mr. Jing's information ecology thought has enriched the information science education system and promoted the development of information science education in China.

Keywords: Jing Jipeng; Information Science; Information Ecology; Academic Thought

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2. The Development Process of Mr. Jing Jipeng's Information Ecology Thought

2.1 Thought Accumulation

Mr. Jing's scholarly approach demonstrates a gradual and progressive character. In the 1980s, he proposed a series of strategic development strategies for information education, marking the beginning of his information work. Subsequently, his research direction shifted toward information science theory, ultimately constructing a user-centered theoretical system for information science. In the 1990s, Mr. Jing recognized that the development of information science must align with national socio-economic development, leading him to launch research in information economics. At the turn of the 21st century, he keenly captured the emerging developments in information ecology. Drawing upon his extensive experience in information work and his review of domestic and international research status in information ecology, combined with the contemporary context, he began to initially construct his own information ecology thought.

2.2 Initial Establishment of Information Ecology Thought

In 1999, Mr. Jing was appointed as a doctoral supervisor in technical economics at Jilin University of Technology, and in 2000 he began enrolling his first cohort of doctoral students, leading them in research primarily within technical economics, including enterprise informatization, knowledge organization, and knowledge management. Also in 2000, Jilin University was approved to offer a doctoral program in information science, and Mr. Jing was appointed as a doctoral supervisor in this field. In his subsequent research, he gradually began exploring new research domains within information science—his fourth major research theme: information ecology. In 2008, Mr. Jing secured the National Social Science Fund project "Research on the Theory and Application of Information Ecosystem Construction," opening the door to information ecology research

and marking the initial establishment of his information ecology thought.

Western scholars began using the term "information ecology" in the 1980s, mainly to describe the relationship between ecological concepts and information environments. In China, information ecology gradually became a research hotspot only in the 1990s. Academician Zhang Xinshi, an ecologist, defined information ecology from an ecological perspective at that time: information ecology extends ecological theory by employing relevant techniques from information science based on information theory, highlighting the connections among humans, ecosystems, and the biosphere, and focusing on comprehensive analysis, judgment, and future development and feedback regarding these issues [1]. Subsequently, scholars began paying attention to information ecology research and published definitions and perspectives, yet no one had systematically developed a coherent theoretical framework.

Starting in 2008, Mr. Jing led his assembled team in analyzing and researching information ecology systems, publishing over ten high-level academic papers that have been downloaded nearly ten thousand times and cited nearly four hundred times. When information ecology research was still in its infancy, these papers had already gained scholarly recognition and served as references for subsequent research.

Through his review of information ecology literature, Mr. Jing further defined information ecology as employing ecological perspectives and methods to study the relationship between humans and information environments, thereby addressing issues of information ecological imbalance, network information ecology, information ecology and social environment, enterprise information ecology environment, information ecology and enterprise informatization, and the integration of information ecology with other information-related disciplines [2]. Guided by problem orientation, he further conducted in-depth research in information ecology. He organized his research team to publish a series of articles including "Research on the Evolution Mechanism of Information Ecology Communities" [3], "Research on the Evolution Process of Information Ecology Communities" [4], "Research on Information Organization Models in Information Ecosystems" [5], "Research on Evaluation and Optimization of Network Information Ecology Environment" [6], "On the Interpretation of Information Ecology Perspective on Enterprise Innovation Mechanisms" [7], "Logical Models and Operating Mechanisms of Enterprise Information Ecosystems" [8], and "Research on Information Synergy Models in Enterprise Information Ecosystems" [9]. These works systematically analyzed information ecology communities, information ecosystems, network information ecosystems, and enterprise information ecosystems, creating many valuable conclusions. This period focused on basic theories of information ecology, forming the cornerstone of the theoretical system and marking the initial establishment of Mr. Jing's information ecology thought.

2.3 Formation of the Information Ecology Theoretical System

In 2011, although already in his seventies, Mr. Jing remained profoundly passionate about information science and accepted a new challenge as the chief expert of a major National Social Science Fund project titled "Research on the Formation Mechanism and Evolutionary Laws of Network Information Ecology Chains." Despite his age, he worked tirelessly, organizing outstanding scholars across disciplines and fields as sub-project leaders to jointly undertake this major research effort. He also convened many renowned scholars to conduct project evaluations, hoping to hear more expert opinions and voices to better complete the research.

Building upon the foundation of his 2008 project, this major project conducted in-depth research on network information ecology. Led by Mr. Jing as chief expert, the research team adopted an interdisciplinary approach, cross-applying research methods from information science, ecology, and information science to analyze the dynamic relationships among elements in network information ecology chains, thereby providing profound elaboration on the formation mechanisms and evolutionary patterns of network information ecology chains.

During this period, Mr. Jing's theoretical thought began focusing on social needs. The research team conducted in-depth studies on fundamental and applied issues of network information ecology chains, including efficiency, evolutionary mechanisms of biological network information ecology chains, information environments of government information ecology chains, and driving mechanisms of social network information dissemination. The team published over forty related high-level academic papers, including "Analysis of the Connotation and Extension of Business Network Information Ecology Chain Concepts" [10], "Research on Information Self-Organization Mechanisms in Virtual Enterprise Alliance Information Ecology Chains" [11], "Research on Information Ecology Issues in Triple Network Convergence" [12], "Empirical Research on the Formation Mechanism and Influencing Factors of Social Network Information Ecology Chains" [13], "Research on Network Information Ecology Chain Models and Optimization Strategies for Social Public Events" [14], "Research on the Constituent Elements, Formation Mechanism, Structure, and Types of Government WeChat Information Ecology Chains" [15], and "Research on the Constituent Elements and Formation Mechanism of Microblog Information Ecology Chains" [16]. These works provided detailed analysis and elaboration on mechanisms, patterns, models, and optimization strategies across business network information ecology chains, social network information ecology chains, microblog information ecology chains, and government information ecology chains.

During this period, while foreign scholars focused on basic theories such as information ecology concepts, constituent elements, and structural models, particularly in e-commerce and e-government, they had not proposed concepts like network information ecology. However, Mr. Jing not only conducted research on basic theories but also emphasized integration with practice, continuously

expanding research objects and scopes by proposing concepts such as government network information ecology chains, business network information ecology chains, information ecology communities, and enterprise information ecosystems. Compared with foreign scholars, Mr. Jing further expanded and perfected information ecology theory, forming a complete theoretical system. Through continuous in-depth research by his team, Mr. Jing's information ecology theoretical system was gradually perfected, further promoting the development of information ecology in China.

2.4 In-depth Development of Information Ecology Thought

A teacher imparts knowledge and resolves doubts—this is the best interpretation of Mr. Jing's role as an educator. Under the influence of his information ecology thought, his students have also shifted their research to information ecology and have been approved for National Social Science Fund projects, continuing his academic legacy and developing it in depth.

In 2011, Professor Zhang Haitao was approved for the project "Research on Information Ecology Environment Analysis and Business Benefit Evaluation of Business Websites"; in 2013, Professor Ma Jie was approved for the project "Research on Network Information Ecosystem Based on Ecological Degree Measurement"; in 2017, Professor Zhang Haitao was approved for the project "Research on the Collaborative Creation Mechanism of Value in Business Network Information Ecology Chains"; in the same year, Professor Ma Jie was approved for the key project "Research on Information Collaboration Structure and Model in Smart Cities from an Information Ecology Perspective." These approved projects demonstrate that information ecology theory has achieved theoretical enrichment and practical application in business websites, network information ecology, business networks, and smart cities.

The frequent approval of research projects based on information ecology theory fully demonstrates its strong applicability in providing ideological guidance across numerous research fields.

3. Mr. Jing's Information Ecology Thought System

3.1 Theoretical System

Mr. Jing's book *Information Ecology Theory and Application* closely integrates with the current development status of information ecology in China, incorporates recent scientific research achievements in the field, and systematically elaborates on information ecology theory and its applications. His theoretical system can be summarized into three aspects: disciplinary theory, basic theory, and applied research.

3.1.1 Disciplinary Theory The fundamental theoretical research of information ecology primarily includes the research object, research content, disci-

plinary nature, and relationships with other disciplines. Mr. Jing believes that research methods in information ecology should shift from traditional qualitative research to a combination of qualitative and quantitative methods, further expanding new research methods and integrating multiple approaches to conduct information ecology research.

3.1.2 Basic Theory Mr. Jing's basic theory of information ecology mainly comprises three components: basic theory of information ecosystems, information niche theory, and information ecology chain theory. The basic theory of information ecosystems focuses on concepts, constituent elements, structural models, properties, functions, types, and characteristics of information ecosystems, as well as the interaction mechanisms among these elements. Information niche theory primarily examines the concept, dimensions, width, overlap, formation, change, and optimization of information niches. Information ecology chain theory mainly investigates the conceptual system, constituent elements, structural models, growth mechanisms, operating mechanisms, and optimal management of information ecology chains.

3.1.3 Applied Research Domain-specific information ecology research applies general information ecology theories to information ecosystems in different fields, including media ecosystems, information service ecosystems, education ecosystems, network information ecosystems, business network information ecosystems, and government network information ecosystems, to understand their operational and developmental patterns and optimization strategies. Organizational information ecology research applies ecological theories to ecosystems of different social organizations, including enterprise information ecosystems, university information ecosystems, and government information ecosystems, to study their operational patterns and optimization strategies. Regional information ecology research applies information ecology theories to information ecosystems at different regional scales, including national, regional, and cluster information ecosystems, to study their operational patterns and optimization strategies.

3.2 Education System

Mr. Jing is not only an information scientist but also a renowned information science educator. From the beginning of his engagement in information science research, he has been committed to information science education. Throughout his career, he has consistently prioritized the education system while striving to establish an information ecology education system with Chinese characteristics.

3.2.1 Graduate Education in Information Ecology Despite his advanced age, Mr. Jing remains on the frontline of teaching, delivering annual intensive courses to master's and doctoral students on information ecology theory and methods. He encourages graduate students to develop information ecology research in depth, with many choosing topics in information ecology for their

theses—over forty dissertations covering areas including government information services, microblog public opinion, business networks, mobile self-media, and mobile libraries. Information ecology has now gained academic recognition and achieved popularization.

3.2.2 Integration of Theoretical Innovation and Practical Experience
Mr. Jing consistently encourages his students to actively engage in scientific research, using practice to continuously verify theories while enriching theoretical research, thereby continuously improving their capabilities as educators. As frontline teachers, they need to create fresh knowledge to impart to their students. Mr. Jing believes that understanding national conditions forms the foundation for theoretical research and practical work; hearing about something a hundred times is not as good as seeing it once, and speaking about something a hundred times is not as good as doing it once. Only through practical testing can theories become convincing and vibrant. He advocates for students to immerse themselves in real social contexts. Therefore, the department organizes annual internships for students at libraries, archives, and provincial information institutes, allowing them to hone their skills in authentic settings. This approach provides a realistic foundation for their theoretical innovation while giving them the strength and courage to continue innovating.

4. Characteristics of Mr. Jing's Information Ecology Thought

Mr. Jing's academic thought demonstrates strong continuity, spanning information science education, information science theory, information economics, and now information ecology. Each research direction accurately captures the needs of social development. An examination of the content and contributions of his information ecology thought reveals four main characteristics:

4.1 Innovation

Mr. Jing innovatively applied information ecology theory to information science to address issues of information ecological imbalance, network information ecology, information ecology and social environment, enterprise information ecology environment, information ecology and enterprise informatization construction, and the integration of information ecology with other information-related disciplines, thereby constructing an information ecology theoretical system that he continuously developed and applied. He advocated using interdisciplinary research methods, cross-applying information science, ecology, information science, sociology, and other disciplines to research areas including network information ecology, business network information ecology chains, government network information ecology chains, social network information dissemination, and network platform construction.

4.2 Epochal Nature

Ecology primarily emphasizes coordinated development between humans and the natural environment. However, human development and social progress must also consider harmonious development with social organizations and information environments, which has triggered research on information ecology. With foresight, Mr. Jing grasped the direction of epochal development and keenly perceived the future prospects of information ecology theory, solidly advancing his research step by step. From initially establishing information ecology thought, to deepening the theoretical system, and then to developing the applied value of information ecology in depth, he integrated the developmental stages of the era into information ecology theory, creating a truly epochal theoretical thought.

Mr. Jing advocates that information ecology theory should align with social development. Today, fields such as e-commerce, mobile self-media, and smart libraries are applying information ecology theory at different developmental stages. He believes that in the network era, information technology plays an increasingly important role. Adding information technology as a factor aligns with research needs while remaining consistent with the ecological concept of coordinated development.

4.3 Foresight

Mr. Jing propelled the development of information ecology and continuously sought new research directions with his unique vision. His work has gained national-level attention, demonstrating his ability to "plan strategies within the command tent and win victories beyond a thousand miles." He could base himself in the present while predicting the future, thereby launching information ecology research in advance.

Information ecology development has kept pace with epochal development. In 2007, the 17th National Congress of the Communist Party of China proposed "ecological civilization construction," which subsequently became a hot topic of public concern and a frontier research direction for scholars. In 2012, ecological civilization construction was incorporated into the "five-in-one" overall layout at the 18th National Congress and was included in the national "13th Five-Year Plan." Information ecology constitutes an important aspect of ecological civilization construction. Mr. Jing's research captured this trend early, demonstrating remarkable foresight.

4.4 Sustainable Development

Mr. Jing believes that information ecology emphasizes the coordinated development of humans, information, and information environments to achieve dynamic equilibrium and efficient social and systemic development. The theory focuses on harmony and coordinated development as its core tenet, thus possessing sustainable development characteristics. Moreover, information ecology can adapt

to rapidly evolving social needs by absorbing useful factors and generating new ideas. For example, in network information ecology research, while information ecology's three elements (human, information, information environment) remain foundational, information technology has been added as a factor. In the network era, information technology plays an increasingly important role, and its inclusion aligns with research needs while remaining consistent with ecological philosophy.

Mr. Jing believes that future scientific research should further expand and deepen information ecology-related fields, as its theories and methods can help solve many contemporary social development problems. At the technical level, with the rapid development of computer technology, integrating it with information ecology research not only enriches technical methods but also expands application domains for computer technology. At the social level, research should continuously keep pace with the times, addressing current hot topics such as population aging, low-carbon economies, and public opinion management from an information ecology perspective. This approach not only follows current events but also achieves the goal of combining theory with practice.

Looking ahead, information ecology still has substantial room for development. Scholars need to continuously deepen and expand information ecology theoretical systems while following domestic and international research trends, methods, and technologies. Through scientific ecological thought, they should address hot issues in social development, particularly key problems urgently needing solutions in China, forming an information ecology theoretical system with Chinese characteristics and promoting high-quality, high-level scientific exchange on information ecology research both domestically and internationally.

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Author Contributions

Zhang Lianfeng: Article writing and revision; **Zhang Haitao:** Conception and methodology, provision of guidance; **Zhou Honglei:** Collection and processing of Chinese literature.

Abstract: [Purpose/significance] This paper combs Mr. Jing Jipeng's academic thought again, outlines the general picture of his academic thought building, and makes future generations fully understand the essence of his information ecology thought. [Method/process] Through the collection and study of Mr. Jing Jipeng's works and relevant high-level academic papers published in the field of information ecology, as well as the interview with Mr. Jing, Mr. Jing's information ecology thought was divided into 4 stages: the accumulation of ecology thought, the initial establishment of information ecology thought, the forma-

tion of information ecology theory system and the development of information ecology thought in depth. [Result/conclusion] From two aspects of theory system and education system, this paper summarizes Mr. Jing's contribution to information ecology thought, and summarizes four main characteristics of his information ecology thought: innovation, foresight, epochal and sustainable development. Mr. Jing's information ecology thought enriches the information science education system and promotes the development of information science education in China.

Keywords: Jing Jipeng; Information Science; Information Ecology; Academic Thought

Note: Figure translations are in progress. See original paper for figures.