



## Plenary Speech

# A Review of Systematic Innovation Methods: Opportunities and Challenges in the AI Era

### Speaker Name,

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### Speaker Biography:

Dr. YAO Wei is an Associate Professor and Doctoral Supervisor at Zhejiang University, China. He's a Deputy Director at Institute of China's Science, Technology & Education Policy Strategy. His research interests include Human-Computer Collaborative Innovation, Development of Engineering Talent Creativity, Social Entrepreneurship, Inclusive Innovation, and Innovation Management.

### Abstract

The Systematic Innovation Method (SIM) constitutes a compilation of systematic thinking and scientific methodologies aimed at guiding endeavors in technological and commercial innovation. Over the years, the promotions and applications of SIM have been extensive. However, there is a notable scarcity of literature that systematically reviews its progress and challenges. This study meticulously reviewed 96 valuable articles selected from 753 relevant Chinese and English literature sources on China National Knowledge Infrastructure (CNKI) and the Web of Science (WOS) databases. The findings indicate that, after the late 1990s, SIM has exhibited noteworthy headway, particularly with respect to the refinement of its theoretical framework, the integration of tool applications, and its symbiotic fusion with artificial intelligence (AI). Research also indicates that SIM evinces widespread applicability in practical contexts, yielding substantial enhancements in creativity, alongside discernible impacts on intellectual property and socio-economic advantages. Despite these, currently, SIM failed to proactively embrace the digital era resulted in a lack of practicality and generality in emerging industries such as IT and electronic information. Classic TRIZ of SIM also didn't consider modern design needs adequately, such as low energy consumption and aesthetics. Introducing artificial intelligence algorithms can eliminate subjectivity, enhance data analysis, uncover hidden patterns, and provide continuous learning for more accurate and creative solutions. Thus, future research endeavors concerning SIM cloud pivot towards delving into its mechanisms and evidence-driven refinements, optimizing multi-modal collaborative models, and facilitating profound convergence with AI. Such as developing SIM using semi-supervised or unsupervised learning algorithms, creating reinforcement learning algorithms to improve innovation processes and solution quality in SIM, and researching SIM with autonomous learning and new knowledge generation capabilities.

This presentation will facilitate the audience's thorough comprehension of the latest advancements in the Systematic Innovation Method (SIM). Specifically, it will delve into the enhancements made to its framework, integration of tools, and the incorporation of artificial intelligence. Attendees will also gain insights into the challenges SIM encounters in AI era, along with potential research directions for the future.