

Chinese Embroidery in Cultural and Creative Product Design^{*}

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Abstract

Chinese embroidery is an important traditional craft that holds cultural significance and reflects the essence of Chinese culture. With the rise of the cultural creative industry, there is a growing demand for innovative approaches to incorporating Chinese embroidery into a wide range of products. However, a research gap exists regarding methods to address this integration's unique challenges and opportunities adequately. Therefore, this study explores the integration of Chinese embroidery into cultural and creative product design through the synergistic utilisation of the Analytical Hierarchy Process (AHP), Quality Function Deployment (QFD) and the Theory of Inventive Problem Solving (TRIZ). This approach presents a holistic and streamlined design methodology. AHP and QFD are employed to address customer requirements, whereas TRIZ is employed to overcome technical obstacles and foster innovative solutions. This study aims to bridge the research gap by combining qualitative and quantitative methods to explore solutions for integrating Chinese embroidery into cultural and creative product design, tapping into its diverse artistic and cultural potentials. The research objective is to inspire the development of more innovative and culturally significant products, integrating the elements and aesthetics of Chinese embroidery into cultural and creative product design. The significance of this study lies in its incorporation of systematic methods and methodological innovation. Designers can create products that preserve and promote the rich heritage of Chinese embroidery within the realm of cultural and creative product design, ensuring its sustainability and evolution within the cultural creative industry.

Keywords: Embroidery; Cultural and Creative Design; Product Design; AHP-QFD-TRIZ

1 Introduction

Chinese embroidery holds significant cultural value. It is regarded as an important traditional craft and an intangible cultural heritage. In recent years, cultural creative design has been a popular topic in industrial and artistic design, and Chinese embroidery has been the target of investigation in textile and fashion design [1]. This paper explores the application of Chinese

^{*}Project supported by Guangzhou College of Commerce Doctoral Researcher Initiating Funds.

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embroidery in cultural and creative product design (based on the AHP-QFD-TRIZ method) to expand its innovative possibilities.

The integration of Chinese embroidery has been implemented in the current cultural and creative product design practice. Zhang [2] studied the incorporation of embroidery in accessory design. In Peng's [3] studies on cultural and creative design education, embroidery is a traditional craft suitable for integration into modern product design. However, most related studies rely on qualitative research methodologies primarily based on observation and analysis by designers or authors. This approach lacks quantitative research, which could enhance product development precision. On the other hand, some studies have employed more precise design methods, such as TRIZ. Li [4] implemented TRIZ principles in their study, incorporating Kedong embroidery patterns into cultural and creative product design. Similarly, Chen [5] used the QFD-TRIZ approach to develop cultural and creative products based on the intangible cultural heritage of the Yi ethnicity. On the other hand, AHP is commonly employed in developing cultural and creative products. In Zhang's design [6], AHP is used to extract cultural attributes, and in Wang's study [7], fuzzy AHP is integrated to enhance the semantic connotations of cultural and creative products.

Although several studies explore implementing the AHP-QFD-TRIZ method, most are either comprehensive or lack a specific focus on Chinese embroidery. Therefore, this study aimed to explore this research gap by implementing the AHP-QFD-TRIZ method. This entailed integrating Chinese embroidery with cultural and creative products, exploring innovations in the creative process of cultural and creative product design, and exploring the expanded application of Chinese embroidery.

2 Methodology

2.1 Application of the AHP-QFD-TRIZ Method to Chinese Embroidery in Cultural and Creative Product Design

The design method that combines Quality Function Deployment (QFD) and the Theory of Inventive Problem Solving (TRIZ) is known as QFD-TRIZ integration [8]. It is a systematic approach which combines the customer-oriented focus of QFD with the problem-solving principles of TRIZ to enhance the effectiveness and efficiency of product or service design. When QFD and TRIZ are integrated, the design process of integrating Chinese embroidery and cultural and creative product design is more comprehensive and efficient [9]. However, to refine the quantification of the weight values that govern the outcomes of the QFD process, the Analytical Hierarchy Process (AHP) is integrated. AHP calculations offer a more detailed assessment of the weightings assigned to customer requirements, relying on the evaluation by a specialist team [10]. Including AHP enables the QFD phase to accurately and comprehensively capture and prioritise customer requirements. The TRIZ phase resolves technical contradictions related to Chinese embroidery and product design and generates innovative solutions.

The methodology of this study consisted of three steps or stages. Firstly, it involved identifying the research problem or objective which required innovative solutions. This included defining the scope of the research on creative practices in Chinese embroidery and providing an overview of its application in cultural and creative product design. The next step was to gather customer