Research on the design of Liubo chess cultural and creative products based on psychological needs and behaviors

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Abstract: Objective: This study aims to explore innovative ideas and methods for the contemporary and stylish reinterpretation of Liubo chess, thereby facilitating the creative transformation of traditional cultural practices. It is grounded in the analysis of psychological needs and behavioral patterns underlying modern individuals' growing interest in metaphysical themes such as astrology, numerology, and fortune-telling. Methods: Through the collection and analysis of historical documents, the complete process of Liubo—an ancient divination game—is reconstructed. Drawing on D.C. McClelland's social motivation theory, the study examines the psychological drivers behind contemporary divination practices. Leveraging the Fogg Behavior Model, traditional divinatory behaviors are redefined along three dimensions: motivation, ability, and triggers, with the goal of enhancing overall user experience. Conclusion: Based on the behavioral model, three principles are proposed: targeted divination results aligned with motivation, simplified interactions, and visually guided triggers. These principles aim to demystify traditional folk customs while imbuing them with therapeutic cultural value. The redesigned Liubo engages users by resonating with their desire for self-understanding and social connection.

Keywords: Liubo chess; McClelland's social theory; Fogg's behavioral model; cultural and creative industries

As an ancient cultural practice, divination still holds influence in modern society. The internet and technological advances have promoted cultural integration and revived traditional practices, while AI has introduced new forms of digital divination. A NetEase Data Reading survey of 1,748 people found nearly 70% of young users engaged in online fortune-telling—via tarot, horoscopes, AI predictions, and more [1]. A Google search for "free divination" returns over 10 million results, reflecting its integration into daily life and growing demand for personalized spiritual experiences.Liubo, a divinatory board game, originated in the Warring States Period and peaked in the pre-Qin and Han dynasties [2]. Its layout evolved from ritual patterns and appears on bronze mirrors found in ancient tombs. The Chu Ci describes divination in terms of national fate, monarchy, spirit summoning, and celestial phenomena, underscoring its complex role in early society [3].Over time, the meaning and social function of divination have evolved. This study uses the Liubo pattern to explore its historical gameplay and proposes design improvements based on the Fogg Behavior Model to enhance visual, interactive, and structural user experience.

1 Liubo chess game and the Boju divination

Liubo chess, popular from the Warring States to the Qin and Han Dynasties, was divided into Dabo and Xiaobo. Dabo combined gameplay with divination, known as Boju divination, which followed fixed routes across nine positions shaped like L, V, and T, corresponding to the sixty Jiazi. Divination in Liubo chess requires the use of chess tools and wooden slips. The former includes the chessboard and Bo chopsticks, while the latter is the interpretation of the chess moves [4].

Contemporary scholars' research on the rules of Boju divination and the interpretation of its results mainly comes from the "Boju Zhan" bamboo slips unearthed from the Yinwan Han Tomb from the late Western Han Dynasty and the "Western Han Bamboo Slips: Liubo" in the Peking University Collection. Scholars have compared and supplemented these

two sources, focusing on the nine-position names, chessboard diagrams, and interpretation methods. For instance, Zhang Xiancheng and Zhou Qunli[5] revised the diagram of the nine positions; He Lulu[6] proposed a more logical sequence for the nine-position formulas.As for the correspondence between positions and the Jiazi cycle, discrepancies exist in the two texts. Gui Zhiheng[7] corrected these by aligning with established stem-branch pairing principles, consistent with results from Zeng Lanying[8] and Zhang Xiancheng's mathematical reasoning. While no detailed records exist on Boju's exact procedure, scholars like Li Xueqin[9] suggest that finding the day's Jiazi position allows direct interpretation from slips. Wang Ning[10] adds that if no date is predetermined, the divination day is used. Pieces are placed according to the Jiazi, moved based on chopstick throws, and interpreted via inscriptions.

Although historical records differ in their descriptions of Boju divination, its fundamental principles and form remain relatively consistent—similar to regional variations in modern mahjong. By synthesizing various research findings, the operational process of Boju divination can be further reconstructed: In a typical Boju divination session using the Liubo chessboard, the inquirer first identifies the matter of concern—such as travel or marriage—and determines the corresponding date, expressed in the traditional sexagenary cycle (Ganzhi). The diviner then locates the chess position on the nine-point board that aligns with the selected Ganzhi. The inquirer casts five bamboo sticks, and the number of sticks landing on their reverse side determines the number of steps to move on the board. The chess piece proceeds through the designated sequence of positions until it reaches a final location. The interpretation of the divination result is obtained from wooden slips, which provide explanations based on the final position and the nature of the inquiry.

2 The psychological motivations behind modern divination

As youth subcultures have gradually shifted from the margins to the mainstream and from resistance to entertainment, divination culture—as a form of subculture—has also evolved in modern society from traditional belief systems into a form of light entertainment and a social tool[11]. In ancient times, people used divination to predict fortune or misfortune, driven by fear of the unknown and reverence for nature and deities. Divination was seen as a way to foresee and control life.In modern society, the popularity of divination can be explained on two levels. First, innovations in form and media: digital divination, shaped by big data and short videos, offers diverse and engaging experiences. Second, changes in purpose and function: modern divination is no longer solely predictive but also serves as a form of entertainment. Users socialize under the banner of "metaphysics" and find emotional comfort through such games[12,13].According to McClelland's social motivation theory, motivation arises from needs and stimuli. From an individual perspective, divination is driven by the interplay of achievement, affiliation, and power motivations[14].

2.1 Achievement Motivation: Desire for Success

Achievement motivation stems from both the desire for success and the avoidance of failure. Individuals driven by this motivation often pursue excellence, set high standards, and seek feedback. This need is common among those striving for perfection, efficiency, and success, as well as those anxious about societal pressures who seek guidance or relief through divination. Many use divination to set goals or assess progress. When making important decisions—such as career, investment, or relationships—people may turn to divination for guidance and reassurance. Divination also provides psychological support, helping individuals face challenges with greater confidence and strengthen their drive to achieve.

2.2 Affiliative Motivation: Desire for Intimacy

Affiliative motivation reflects the need to form close interpersonal relationships, both directly and indirectly. Direct needs involve emotional affirmation—people seek understanding, especially in uncertain times. Divination offers an external lens to help clarify thoughts and validate emotions. It also encourages emotional expression, as users often share readings and reactions, fostering empathy and emotional bonds. Indirectly, affiliative needs arise from modern challenges in relationships, including communication barriers and trust issues. Emotional uncertainty creates anxiety, and divination offers a way to cope by providing comfort and a sense of clarity.

2.3 Power Motivation: Desire for Control

Power motivation reflects a desire for control over one's life and environment. Divination serves as a tool for restoring this sense of control during uncertain times. It aids decision-making by offering external advice, helps reduce fear of the future through predictions, and provides emotional regulation by offering space for reflection and understanding. Additionally, divination helps individuals assign meaning to their experiences, fostering a sense of direction and control in the face of ambiguity.

3 Design strategy of Liubo cultural products based on Fogg's Behavior Model

The Fogg Behavior Model (FBM), developed by Stanford professor B.J. Fogg, explains behavior as the result of the interaction among motivation, ability, and trigger[15]. Motivation is the internal drive to act; ability refers to the resources or skills required—such as time, effort, or knowledge; and trigger is the prompt that initiates the action. FBM offers a practical framework for behavior design: motivation can be enhanced through incentives, ability can be increased by simplifying actions, and timely prompts can activate behavior when both conditions are met. This model provides a valuable foundation for shaping user engagement in cultural and creative product design, including modern adaptations of Liubo chess.

3.1 Principles of the cultural and creative design of Liubo chess

3.1.1 "Targeted divination results" aligns with psychological motivations

Modern people's enthusiasm for divination reflects personal needs related to achievement, affiliation, and power, which vary by age group. Young adults facing life transitions—such as career, relationships, and study—often use divination to ease anxiety over these challenges. Middle-aged individuals focus more on career and family, with a strong desire for wealth and status; they turn to divination to predict career development and social standing amid competition and resource scarcity. The design of "targeted divination" is based on understanding these psychological motivations and key life events users care about. When creating divination game outcomes, results are set based on user needs and a balanced ratio of positive and negative predictions, following a normal distribution to ensure game fairness and realism.

3.1.2 "Simplified Play Toys" Improve Behavioral Ability

Traditional Boju divination involves the seeker choosing a date, identifying its Ganzhi, and the diviner locating the matching position on the Boju map to interpret results. The complexity of the practice lies in three main aspects: modern users are unfamiliar with the Ganzhi calendar; the layout of the Boju board is intricate and difficult to comprehend; and traditional tools such as the chessboard and bamboo slips are cumbersome to use.To reduce user difficulty, traditional divination tools need improvement. First, replace the stem-and-branch method for matching chess positions with the last digit of the modern Gregorian calendar date (0–9) corresponding to nine chess positions. Second, simplify the gameplay by changing the complex move order ("Gao-Chang-Qu-Qu-Chang-...") to a single path on the chessboard, allowing users to move along the track easily. Finally, streamline the chess tools by shifting from the traditional two-player chopstick-throwing game to a single-player format, and redesign the chessboard as a portable and attractive pendant.

3.1.3 "Guiding visual design" increases the chance of triggering

Divination game results offer spiritual and emotional comfort, helping players find temporary answers and relief. As a game rooted in traditional Chinese chess, it carries rich cultural meaning. Design should reveal this cultural core and guide user experience. Pendants serve as decorative items, and by adding persuasive visual elements, they embody cultural connotations while blending modern design with tradition. When carried, the pendant's reminder function and visual cues encourage more frequent use.

4 Liubo chess pendant design based on Fogg's behavior model

4.1 Divination Results Design

The design of the divination results aims to meet the psychological needs of modern young and middle-aged users under 50. Based on user research, six divination themes with the highest user interest were selected: wealth, health, marriage, study, travel, and career. Through dialogue with ChatGPT, 54 divination results linked to 9 chess positions were

generated. The divination outcomes are distributed according to a normal distribution to minimize extreme results and maintain credibility. After five rounds of iteration, extreme descriptions were removed and others refined. Divination descriptions were categorized into five levels: completely positive (5 points), positive trend (4 points), no change (3 points), negative trend (2 points), and completely negative (1 point).The 54 divinations were numbered 01-054, and their positive and negative properties were quantified .These 54 divinations were coded and analyzed in SPSS for normality. The results show that the absolute value of skewness is less than 2, and the absolute value of kurtosis is less than 7, indicating an approximate normal distribution[16].

4.2 Gameplay Design

The divination pendant gameplay simplifies and modernizes the traditional divination process. Instead of using stems and branches, the last digit of the divination date replaces them. Users scan a QR code for divination queries and gameplay instructions, offering convenience. First, the user determines the last digit of the date, such as 4 for August 24, then finds the corresponding chess position as the starting point. Next, the number of moves is decided by throwing five chopsticks, with the count based on the number of front and back sides showing, similar to dice rolling. The user then moves along a preset chess route until reaching the end position. Finally, the divination result is found based on the intersection of the end position and the divination topic. This method maintains the randomness and ritual of traditional chess divination while simplifying the process with modern interaction, better suiting modern users.

4.3 Pendant appearance design

To better understand the preferences of young and middle-aged users, in-depth interviews were conducted with five university students and faculty members. The results reveal that users value a blend of traditional elements with a modern, stylish, and playful aesthetic. The Liubo game pattern, derived from the Liubo chessboard, features symbolic "L, V, T" shapes that carry cultural significance and visual appeal. Preserving these elements connects users with traditional heritage and enhances cultural identity and emotional engagement during gameplay. In terms of color selection, purple is the main color. Psychological research shows that it is often associated with mystery, nobility and wisdom[17]. At the same time, purple has a strong visual appeal. Modern people have an increasing demand for personalization and emotional connection. The integration of IP elements not only weakens the superstitious color of pendants , but also makes them a kind of emotional sustenance and cultural symbol, enhancing users' identification and loyalty to pendants. In this way, pendants are not only a divination tool, but also a cultural carrier that integrates entertainment and aesthetic value.

5 Conclusion

This paper reconstructs the traditional Liubo divination game and examines the psychological motivations behind contemporary interest in such practices. Findings suggest that user engagement arises from both external influences and internal drives related to achievement, affiliation, and influence. To enhance user experience and modernize the traditional game, the study applies the Fogg Behavior Model to propose three design principles: "targeted divination results" to meet psychological motivation; "simplified gameplay toys" to improve behavioral ability; and "guided visual design" to increase the trigger probability. These principles align the game with current behavioral patterns, promote sustained engagement, and contribute to psychological well-being. This research offers innovative approaches for the design of cultural and creative products that respect heritage while meeting modern user needs.

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