

A Semiotic Approach to the Design Strategy of Stationery Items in Gansu bamboo slips Culture

Yao Pan¹, Arkom Sangiamvibool^{2*}

¹ Faculty of Fine-Applied Arts and Cultural Science, Mahasarakham University, Thailand. ORCID ID: <https://orcid.org/0009-0002-5074-9389>

*Corresponding Author: Arkomsang@gmail.com

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ABSTRACT

This study examines the cultural and design techniques of Han Dynasty bamboo slips from Gansu from a semiotic standpoint, viewing the slips as both administrative tools and cultural emblems. Using Saussure's signifier and signified framework, Barthes' myth theory, and Eco's sign classification, the study deconstructs bamboo slips across visual, material, and semantic dimensions to reveal their layered meanings in clerical calligraphy, binding formats, and narrative inscriptions. Building on this theoretical foundation, the study presents the SFS model, which includes symbol translation, functional adaptation, and scenario integration, as a systematic design approach for translating bamboo slip culture into modern stationery goods. Case studies of a modular pen holder, a calligraphy brush stand, and an ink stone show how symbolic narratives, material metaphors, and technological advancements like CNC carving and AR/NFC interaction can bring historical authenticity to modern user experiences. Mixed-method evaluations integrating eye-tracking research, usability testing, and user interviews reveal that symbolic recognition and narrative intensity greatly improve cultural identity, while digital interaction is more engaging for younger audiences. The findings add to design history, semiotics, and cultural heritage by providing a reusable technique for incorporating traditional symbolism into creative enterprises, supporting sustainable practices, and furthering the living transmission of regional culture in contemporary situations.

Keywords: Semiotic design, Bamboo slips culture, Cultural symbol translation, Stationery product innovation, SFS design model.

INTRODUCTION

The twenty-first century has seen rapid globalization and technological transformation, reshaping cultural output, creative industries, and design education. In this perspective, material culture is crucial not just for preserving heritage, but also for producing new design concepts. The reinterpretation of old artifacts has become a major concern for designers seeking to connect historical significance with modern uses. Regional cultural forms with particular symbolic value are especially important because they preserve historical memory while also providing adaptive frameworks for innovation.

Among these forms, bamboo slips stand out as a key medium in Chinese civilization. As early writers, they document the Qin and Han dynasties' political, economic, and cultural practices, and creative achievements in calligraphy and handicraft. Gansu Province has the most excavated bamboo slips, with collections like the Juyan and Xuanquan slips offering distinct examples of literary structure and material form. Despite their significance, bamboo slips remain difficult for the general public to obtain, and most cultural and creative items that reference

them rely on surface ornamentation rather than meaningful translation. This instance exemplifies the difficulty of converting archeological items into live cultural resources.

Semiotic theory provides a framework for addressing this issue by demonstrating how cultural symbols can be decoded and reinterpreted. Saussure's concept of the signifier and signified, Barthes' analysis of myth, and Eco's typology of signs are all useful tools for understanding how meaning is formed and distributed. Semiotic techniques have already been used to adapt Dunhuang paintings and Liangzhu jade motifs into contemporary design, but bamboo slips are yet underexplored from this perspective. To be effective, the translation of bamboo slip culture into design must include visual, material, and semantic components while retaining symbolic depth and functional relevance.

This study addresses this gap by analyzing the symbolic systems of bamboo slips from the Gansu Bamboo Slips Museum and establishing a semiotic-based design framework. It presents the SFS methodology, which includes symbol translation, functional adaptation, and scenario integration, as a systematic approach to transforming bamboo slip culture into modern stationery design. The paper explains how semiotics may influence the development of creative cultural products through theoretical deconstruction, design case studies, and mixed-method evaluation. The study adds to both academic debate and design practice by demonstrating how symbolic translation might enable sustainable cultural heritage transmission while also fostering creative industries in a globalized world.

LITERATURE REVIEW

Semiotics in Design and Cultural Theory

Semiotics provided a fundamental framework for studying how meaning is constructed and conveyed in cultural situations. Saussure's concept of signifier and signified established the principle that material objects serve as both physical forms and carriers of symbolic meaning (Saussure, 2011). This concept helped shape early cultural studies and continues to influence design study. Peirce later developed semiotic theory with his triadic structure of representamen, object, and interpretant, emphasizing the dynamic and interpretative process of signals (Peirce, 1931-1958). Together, these ideas provide a platform for investigating objects like bamboo slips as both metaphorical and functional systems. Their combined discoveries demonstrate that material culture is inextricably linked to the social ideas it conveys.

Barthes expanded semiotic research by distinguishing between denotative and connotative levels of meaning, emphasizing how everyday signs get infused with larger myths and ideologies (Barthes, 1972). His application of semiotics to cultural activities reveals how design products can carry tales beyond their intended function. Bamboo slips can be considered not just as governmental instruments, but also as cultural emblems of power, order, and literacy throughout the Han period. This interpretive lens demonstrates how material artifacts evolve from functional tools to symbols of community imagination and identity. Bamboo slips are integrated into a larger story of cultural power and symbolic expression when placed inside this framework.

Eco expanded semiotic theory by categorizing signs as iconic, indexical, or symbolic, giving designers categories to understand and apply cultural meaning (Eco, 1976). Later, Krippendorff (2006) created design semantics, which emphasizes that goods interact with people via symbolic clues encoded in their form and function. These contributions indicate that the study of bamboo slips necessitates more than technical investigation. Instead, it calls for attention to how their materials, inscriptions, and formats carried symbolic significance. When reinterpreted in design, these qualities can be transformed into important creative pieces that preserve cultural richness while engaging new audiences. This approach assures that semiotics may serve as both an analytical tool and a design process.

Norman's work on emotive design revealed that semiotics affects user engagement by affecting instinctual, behavioral, and reflective experiences (Norman, 2004). Products not only convey utilitarian value, but also elicit emotional and cultural connotations. Japanese minimalist items, such as those made by MUJI, demonstrate how semiotic methods can suggest simple ideologies while being practical and efficient. When applied to bamboo slips, this paradigm suggests that symbolic elements might be incorporated into design processes to elicit both utilitarian satisfaction and contemplative participation. This dichotomy ensures that reinterpretation is attentive to both user experience and cultural relevance. Finally, this balance increases the cultural significance of designed objects over generations.

Semiotics is increasingly being used in heritage design to preserve and interpret traditional items. Scholars emphasize that decoding symbolic aspects allows for creative adaptation into modern products while preserving authenticity (Zhang, 2025). Semiotics can be used to study bamboo slips as transmitters of complex meanings that include visual, material, and linguistic qualities. Their reinterpretation provides ideas for incorporating traditional

culture into contemporary design systems. Semiotics provides not only a theoretical foundation for maintaining symbolic legacy, but also a practical way for creating creative goods that promote cultural sustainability in modern society. This demonstrates semiotics' rising relevance as a link between traditional and forward-thinking design practices.

Historical Role of Bamboo Slips in Chinese Culture

Bamboo slips were the primary writing medium in China prior to the widespread introduction of paper, and they served as the foundation for information transmission during the Qin and Han dynasties. Their use was an important step in the growth of written communication, connecting oral traditions to codified texts (Loewe, 1967). Excavated documents from Gansu, such as the Juyan and Xuanquan slips, provide important evidence of administrative, legal, and educational activities. These relics show how bamboo slips served as both bureaucratic instruments and cultural repositories. They documented not only legal edicts and directives, but also philosophical writings, medical prescriptions, and calendars. Their preservation demonstrates how material culture facilitated government while also reflecting intellectual currents.

The archeological record shows that bamboo slips were used in everyday life and for official purposes, providing evidence of home management and interpersonal communication. Letters, contracts, and intimate notes unearthed from Gansu show how bamboo slips entered personal and societal worlds (Zhang, 2025). This diverse spectrum of content proves their adaptability as a means of information communication. At the same time, errors reflect the complexities of early Chinese culture, where literacy and administration intertwine. Scholars can learn about how writing influenced relationships at the state and communal levels by studying these records. Their relevance extends beyond textual content, as they represent ancient Chinese social processes.

From an artistic standpoint, bamboo slips represented the evolution of Chinese calligraphy. Many slips from the Han period illustrate the transition from seal script to clerical script, demonstrating stylistic innovation and adaptability to new writing instruments (Tsien 2004). Bamboo's material limits necessitated the use of unique brush techniques, which influenced stroke pattern development and spatial composition. As a result, bamboo slips maintain more than textual information; they represent the beauty of writing. The slips' irregular spacing and unusual brushwork provide obvious evidence of changing calligraphic traditions. This combination of art and function emphasizes their twin roles as records and visual symbols. They are still valuable objects for both linguistic and artistic study.

Bamboo slips demonstrate the workmanship and technical competence of their makers. The process of breaking bamboo, smoothing surfaces, and tying slips with hemp or silk thread represented both functionality and symbolic order (Loewe, 2006). Binding provided physical coherence while also symbolizing the social organization of the time. Different binding strategies highlight hierarchical differences across types of documents. For example, legal codes often used tighter bindings, reinforcing their role as enduring and authoritative records. These features demonstrate how material design supported written meaning. Scholars can learn more about how cultural values were incorporated into physical forms by studying their craftsmanship.

Beyond their immediate historical use, bamboo slips have had a long-lasting impact on Chinese cultural identity. They symbolize both the transfer of early knowledge and the preservation of symbolic memory within material objects (Csikszentmihalyi, 2004). Contemporary interpretations of bamboo slips in museums and cultural enterprises emphasize their significance as heritage symbols. Their ongoing research reveals how ancient objects shape contemporary understandings of literacy, governance, and art. Furthermore, the recovery of slips in Gansu has reignited interest in their cultural significance, linking archaeological discoveries to design applications. Bamboo slips remain enduring icons of Chinese civilization, representing both continuity and evolution.

Lastly, the use of bamboo slips in cultural history emphasizes the significance of material media in shaping intellectual traditions. Unlike fleeting oral conversations, slips generated long-lasting recordings that ensured the survival of writings over generations. Their impact spread along the Silk Road, where written communication became critical for trade and diplomacy (Tsien, 2004). The slips demonstrate how material items shaped historical memory and enabled cross-regional cultural interchange. By connecting local governance to larger communication networks, they demonstrate the interconnection of culture, politics, and technology. Their lasting existence exemplifies the unbreakable link between material design and the construction of community identity.

Symbolic Dimensions of Bamboo Slips

The visual dimension of bamboo slips is one of its most distinctive symbolic layers, as evidenced by both calligraphic style and compositional structure. Slips, according to scholars, retain the shift from seal script to clerical script while also preserving the stylistic developments that created Chinese writing. The brushstrokes, which are frequently described as having the "silkworm head and swallow tail" shape, show technical adaptations to bamboo

as a writing surface. These visual characteristics were more than just aesthetic decisions; they were also indicators of administrative efficiency and cultural identity. The characters' uneven spacing and segmented arrangement reflect a purposeful visual organization plan. Bamboo slips can be interpreted as a semiotic system of visual signs that serve as a link between shape and meaning.

Equally significant are the material dimensions of bamboo slips, which represent order, durability, and hierarchy. Binding individual slips using hemp or silk thread resulted in a unified literary unit that mirrored the state's social and political organization (Loewe, 2006). For example, legal papers frequently utilized tightly bound structures to emphasize permanence and authority, whereas more flexible bindings were retained for daily records. This material logic served both functional and symbolic goals, emphasizing bamboo slips' importance as governing tools. Their physical features consequently have cultural ramifications, transforming an ordinary substance into a symbol of security and legitimacy. The act of tying itself served as a symbol for social order.

The semantic dimension of bamboo slips enhances symbolic richness by incorporating cultural narratives into textual recordings. Administrative edicts, court decisions, and calendar entries go beyond practical communication to represent cultural ideals and communal memory (Barthes, 1972). For example, judicial papers kept on slips not only recorded punishments but also represented the state's moral authority. Seasonal records, too, contained the cosmological and agricultural rhythms that governed social life. These textual meanings, when evaluated semiotically, demonstrate how slips served as narrative bearers, connecting daily administration to larger ideological systems. In this sense, bamboo slips reveal the ability of words to construct symbolic worlds and deliver facts.

The interaction of visual, material, and semantic elements demonstrates the multidimensionality of bamboo slips as cultural relics. Their design combines aesthetic practice, technological mastery, and narrative composition. This triadic system is consistent with Peirce's paradigm of signs, in which representamen, object, and interpretant interact to produce meaning (Peirce, 1931–1958). Each dimension strengthens the others: calligraphy visually communicates authority, binding materializes order, and text sustains ideology semantically. Together, these symbolic layers elevated bamboo slips to status beyond utilitarian media, transforming them into enduring cultural symbols. Their continuous relevance emphasizes the significance of analyzing artifacts as semiotic systems rather than isolated items.

Design Translation of Traditional Cultural Symbols

Translation of old cultural symbols into contemporary design necessitates a strategy that preserves their original significance while adapting them to modern circumstances. Scholars contend that cultural symbols cannot be immediately incorporated into modern products without careful interpretation, as literal duplication threatens superficiality (Zhang, 2025). Instead, designers must first examine the semiotic layers hidden in visual motifs, material properties, and symbolic tales before adapting them. For example, jade patterns from the Liangzhu culture were abstracted into furniture design using proportional and geometric analysis (Liu, 2023). This demonstrates how symbolic translation extends beyond cosmetic application to include systematic cultural thinking. In this sense, the method maintains authenticity while also promoting relevance to contemporary design practice.

One critical concern is the link between symbolic form and product function, as decoupling the two frequently results in cultural misalignment. The usage of bamboo slip inscriptions on acrylic souvenirs highlights the issue of surface collage without practical meaning (Wang, 2024). When symbols are reduced to adornment, they lose expressive depth and cultural resonance among users. Design semantics research emphasizes the importance of functional adaptation in ensuring that cultural expression is entrenched in the user experience (Krippendorff, 2006). For example, Dunhuang mural figures that have been turned into interactive installations provide both visual beauty and sensory value. The lesson for designers is that symbolic translation must combine cultural narratives with practical functionality to remain meaningful.

Material innovation is also important in cultural symbol adaptation, particularly when traditional resources are unavailable or incompatible with modern use. Research in sustainable design shows that bamboo fiber composites, recycled paper, and digital fabrication can mimic the tactile properties of older materials (Han et al., 2023; Huang & Wang, 2014). Such solutions lessen environmental effect while retaining the symbolic meanings of traditional workmanship. In the case of bamboo slips, contemporary pressing and engraving techniques can reproduce vertical grain patterns while maintaining durability. These changes allow cultural symbolism to be aligned with ecological and technological concerns. Designers promote cultural continuity and environmental responsibility by combining symbols with sustainable approaches.

Narrative reconstruction is another important step in turning symbols into user-friendly goods. According to Barthes (1972), notion of myth, cultural texts can be recast as modern stories that go beyond their original context. Bamboo slip records from legal proceedings or seasonal calendars can be converted into product narratives that link history and modern life. A stationery set, for example, may have inscriptions of solar phrases to define the rhythm of daily scheduling. Products become vehicles for cultural narrative when they relate symbolic value to

ordinary actions. Such tactics highlight how reinterpretation enables symbols to transcend archaeology and infiltrate everyday life.

Digital technology enhances symbol translation by enabling hybrid types of engagement. Augmented reality apps and NFC tags can infuse cultural stories into items, resulting in dynamic experiences that go beyond static ornamentation (Liu, 2023). Users can scan an object to watch animations of bamboo slips being discovered or learn old calligraphy techniques. These technologies improve symbolic resonance by combining physical design with virtual narrative contexts. Scholars point out that digital integration not only modernizes cultural expression, but also appeals to younger generations who are used to interactive media. In this regard, technology serves as a link between historical protection and cultural creativity. Its adoption demonstrates the growing possibilities of semiotic design in the digital age.

Theoretical frameworks continuously emphasize that effective symbol translation necessitates systematic mediation between tradition and innovation. Semiotics offers analytical techniques for detecting signifiers, material metaphors, and cultural myths that can inform design practice (Eco, 1976). When used wisely, these frames avoid uniformity and allow for true reinterpretation, which enriches cultural identity. At the same time, practical tactics like material substitution, functional adaptation, and narrative reconstruction ensure that symbolic depth is preserved. Empirical studies show that designs that incorporate cultural tales evoke more user familiarity and attachment than generic decorative objects (Zhang et al., 2025). Thus, translating traditional symbols into design necessitates a comprehensive approach that considers legacy, utility, and current aesthetics.

Semiotic Approaches to Product Design Innovation

Semiotic approaches to product design innovation highlight that symbols serve as cultural communicators rather than ornamental elements. Saussure's theory of the signifier and signified serves as a framework for understanding how visual and material features convey cultural values. When used to design, this framework enables designers to transform traditional motifs into identifiable yet updated forms with symbolic resonance. For example, the curved strokes of Han ecclesiastical calligraphy can be abstracted into product forms that both reference tradition and cater to modern desires. Designers must strike a balance between adherence to cultural meaning and the simplicity required for usability. Semiotics offers a means for preserving symbolic continuity while ensuring that innovation is accessible to a wide audience.

Peirce's triadic paradigm improves semiotic interpretation by locating meaning in the interaction between sign, object, and interpretant (Peirce, 1931–1958). This viewpoint emphasizes how cultural items generate meaning through user interpretation, rather than just through their construction. For product design, this emphasizes the need of anticipating user literacy and cultural understanding. A pen holder inspired by bamboo slip bindings only offers order when its modular design is understood as an echo of compilation structures. Krippendorff (2006) contends that design communication succeeds when the symbolic intent is consistent with user interpretation. Semiotic frameworks promote design innovation by guaranteeing that cultural objects welcome active decoding and interpretive interaction.

Emotional design enhances semiotics by connecting functionality with cultural resonance. Norman (2004) defines three stages of design: instinctual, behavioral, and reflective, each of which can be enhanced by symbolic expression. Visual signals elicit intuitive responses, functional adaptations meet behavioral demands, and narrative references foster reflective links to heritage. This three-part model highlights how semiotics can link practical applications with cultural narrative. For example, a brush holder inspired by the character "year" fulfills ergonomic benefits while also incorporating historical parallels to the passage of time. Such dual roles demonstrate the potential for cultural artifacts to serve as both utilitarian products and symbolic transmitters of identity.

Material selection is equally important in semiotic innovation since physical attributes carry symbolic significance and technical properties. Eco (1976) observed that signs have material and sensory components that influence interpretation. In bamboo slip culture, the vertical grain of wood signifies order and resilience, which may be recreated using sustainable bamboo fiber composites. This substitution strikes a balance between symbolic continuity and ecological considerations, preserving texture's communication role while lowering environmental impact. Contemporary materials might thus be used not only for performance, but also for their semiotic resonance with historical forms. Semiotics therefore guides the combination of material symbols and creative ecological methods.

Narrative intensity promotes semiotic design by incorporating historical narration onto utilitarian items. According to Barthes (1972), myths allow symbols to be re-coded for new ideological goals while keeping vestiges of their original meaning. Bamboo slip judicial documents, for example, can be reinterpreted as motifs in stationery design that encourage people to think about law and governance. Symbolic storytelling transforms everyday products into vehicles for cultural recall. Users interact with objects on both functional and narrative levels, which strengthens

their relationship to tradition. Semiotic methods transform static items into interpretive experiences that connect modern living to collective historical memory.

Digital technologies expand semiotic design by enabling hybrid forms of cultural communication. Augmented reality applications animate symbols by human interaction, extending meaning beyond physical elements (Liu, 2023). NFC-enabled products allow access to digital tales, which reinforce cultural symbolism through interactive storytelling. These inventions support semiotic principles by illustrating that meaning is dynamic and context-dependent, moving across physical and virtual domains. Grimaldi, Fokkinga, & Ocnareescu (2013) emphasize how interactive symbolism is especially appealing to younger people who seek customization and technological integration. Designers ensure the relevance and engagement of heritage by incorporating traditional symbols in digital platforms. Semiotics therefore promotes product innovation that combines traditional and contemporary technical processes.

RESEARCH METHOD

This research employed a qualitative design technique based on semiotic analysis. The core materials were bamboo slip relics stored in the Gansu Bamboo Slips Museum, which provided the study's cultural and symbolic underpinning. The goal was to rethink their meanings and apply them to contemporary stationery design frameworks.

Semiotic theory provided the analytical underpinning. Saussure's signifier-signified paradigm, Barthes' theory of myth, and Eco's sign categorization were used to deconstruct the visual, material, and semantic features of bamboo slips. This theoretical framework informed the selection of symbolic elements appropriate for product translation. Research followed a rigorous design process. A categorization model for bamboo slip symbols was developed, which divided visual, material, and semantic categories into functional subcomponents. This classification underpinned the SFS paradigm, which incorporated semiotic principles and user-centered design.

Technical development was done using contemporary design tools. Parametric modeling, CNC carving, and 3D printing were used to recreate bamboo slip calligraphy, binding structures, and textures. Sustainable materials, such as bamboo fiber composites, were used to replicate historical authenticity while minimizing environmental impact. Prototype testing was used to assess symbolic recognizability and functional performance. Handcrafted models and computer simulations were evaluated using small-scale user interactions, with an emphasis on usability, cultural identification, and emotional reaction. Feedback guided iterative changes to symbol density, material balance, and interaction design.

The method used to do so included theoretical deconstruction, technical experimentation, and user validation. By combining semiotics and practical design techniques, it established a repeatable pathway for translating bamboo slip culture into cultural and creative products. The results and discussion sections present the findings from these methodological stages.

RESULTS AND DISCUSSION

The use of the SFS paradigm in stationery design illustrated how semiotic deconstruction may be translated into creative practice. Three prototypes were created as case studies, using visual, material, and semantic symbols from Gansu bamboo slips: a pen holder, a brush holder, and an ink stone. Each object blended symbolic allusions with functional logic, demonstrating that semiotics can be used as a practical design process rather than just a theoretical instrument.

The pen holder case demonstrated how modular construction might replicate the binding shapes of bamboo slips while meeting modern user requirements. Its structure mimicked the fluidity of slip composition and used bamboo fiber composites to create genuine textures. Users reported both cultural resonance and practical flexibility, indicating that symbolic abstraction did not impair use.

The brush holder design facilitated the translation process by transforming the character for "year" into a three-dimensional support system. The suspended ink mechanism created a metaphorical link to the flow of writing while addressing a functional issue with standard brush stands. Material contrasts like brass and obsidian strengthened historical connections and added symbolic depth that people might recognize.

The ink stone prototype supported the combination of narrative and function. Its structural divisions were based on historical law texts, which transformed textual structure into functional zones for grinding, storage, and interaction. Embedding an NFC chip gave a digital extension of the artifact and demonstrated how symbolic translation may connect tangible heritage with digital cultures.

The evaluation results revealed that the SFS model struck a balance between cultural identity and modern aesthetics. Eye-tracking data, task performance, and user interviews all indicated high recognition of symbolic elements and considerable emotional resonance. Narrative intensity and recognizability were identified as the most

important drivers of cultural identity, confirming the premise that rigorous semiotic translation can improve both design authenticity and user engagement.

Design Framework: The SFS Model

The semiotic research of bamboo slip symbols resulted in a design framework that considers cultural meaning, human demands, and technical feasibility. The SFS paradigm, which stands for Symbol Translation, Functional Adaptation, and Scenario Integration, provides a structured pathway for incorporating cultural heritage into product design. It serves as the study's methodological core, linking theoretical symbol deconstruction to actual design methodologies.

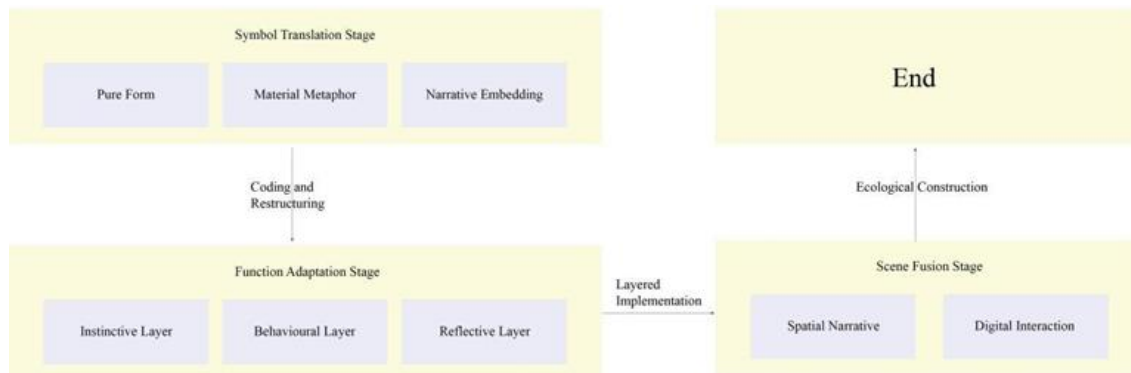


Figure 1. SFS three-stage design model

Case Study: Calligraphy Brush Holder

The calligraphy brush holder is a symbolic translation of bamboo slip characters into a utilitarian design object. Drawing on the clerical script form of the character "year," the structural deconstruction into horizontal, vertical, and dot strokes was reinterpreted as physical components of the holder. This design not only captured the essence of old calligraphy, but also transformed it into a modern product with practical applications. By combining semiotic meaning with ergonomic considerations, the brush holder displays how cultural symbols may be reconstructed into design elements that improve both aesthetic and practical aspects.

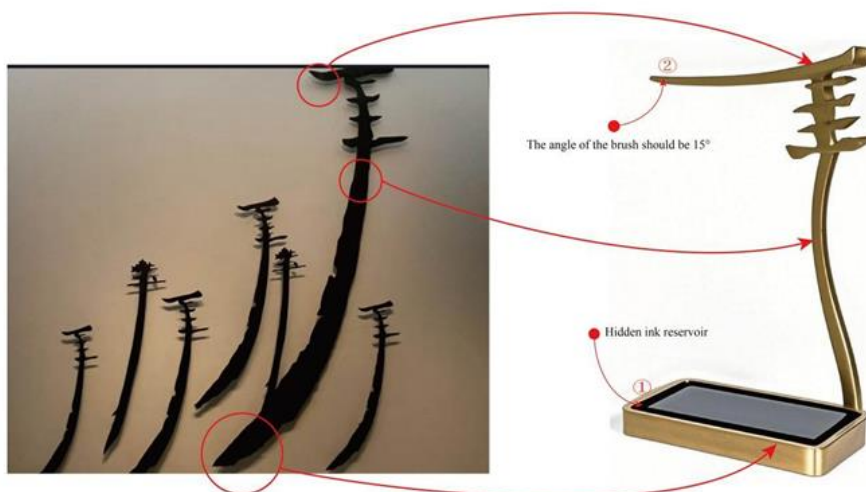


Figure 2. Calligraphy brush holder design based on the Chinese character "year."

Case Study: Ink Stone Design

The ink stone design demonstrates how judicial words written on bamboo slips can be reinterpreted using symbolic and material translation. Inspired by the Second Year of Ganlu Letter from the Chancellor and Censor, its structural composition was transformed into functional zones, with inscriptions and textures strengthening cultural significance while retaining usability. The combination of traditional symbolism and modern workmanship, such as CNC carving and tactile detailing, establishes the ink stone as both a functional instrument and a vehicle for cultural transmission.



Figure 3. Ink stone design integrating symbolic narrative and material craftsmanship

Symbol Classification and User Validation

Bamboo slips represent a multilayered symbolic system with visual, material, and semantic components. To put this complexity into design practice, a classification framework was created that divides symbols into three categories: form, function, and meaning. This framework establishes a formal foundation for converting cultural heritage into design elements while preserving their integrity. By providing a precise taxonomy, designers can determine whether aspects of history can be preserved, simplified, or reinterpreted for product innovation. The classification demonstrates how symbols serve both cultural and functional goals in current applications. Calligraphic forms, for example, provide historical aesthetics while directing product surface embellishment. At the same time, the binding structures found in bamboo slips affect modularity and assembly in modern product design. These examples show how cultural meaning and functional use are inextricably linked within the classification, bridging the past and today.

The framework also highlights inconsistencies between legacy and product usefulness. Texts that were judicial or ritualistic during the Han dynasty may not be directly comparable to consumer products today, resulting in potential interpretation problems. Narrative adaptation and metaphorical translation are thus critical tools for closing these gaps. By viewing contradictions as opportunities, the classification system assures that cultural values can be preserved while meeting new practical requirements.

Table 1. Classification of Gansu Bamboo Slips Cultural Symbols

Symbol Category	Form (Signifier)	Function (Extension)	Meaning (Intension/Myth)
Visual Symbol	Wavy brushwork, irregular layout	Typeface recognition, information layering	Lishu reform, efficiency-oriented
Material Symbols	Bamboo and wood materials, interwoven structures	Textual carriers, scroll combinations	Nature worship, order metaphor
Semantic symbols	Judicial documents, records of daily life	Legal enforcement, daily communication	Power narratives, social relationship restructuring

Validation was carried out to see how well these identified symbols could be transformed into cultural items. A mixed-method review revealed that designs stressing symbolic recognizability and utility were the most well-received. The classification also influenced prototyping, emphasizing the importance consumers placed on calligraphic themes and modular assembly structures. The findings revealed that users saw these aspects as the most obvious link between historical authenticity and modern design innovation.

When assessing the reception of classified symbols, generational differences became apparent. Younger users praised the digital additions that increased symbolic narrative, whereas older participants preferred tactile authenticity and material consistency. These findings indicated that the classification system organizes symbolic content and predicts user engagement. By catering to both demographic preferences, the model reinforces its position as a design tool that balances legacy and usability.

Table 2. Comparison of Regional Cultural Identity

Group	Sample Size (N)	Mean (M)	Standard Deviation (SD)	t-value	p-value
Experimental group (code symbol)	—	6.1	—	8.92	<0.001
Control group (ordinary cultural and creative products)	—	4.3	—	—	—

The comparison results revealed that the experimental group, which received consistently translated cultural artifacts, expressed a significantly greater sense of regional cultural identity than the control group. The difference in mean scores ($M = 6.1$ vs. $M = 4.3$) was statistically significant ($t = 8.92$, $p < 0.001$), demonstrating the usefulness of semiotic translation in improving cultural belonging. This result is consistent with existing findings in cultural identification research, which suggest that symbol recognizability and meaningful narrative integration strengthen users' loyalty to their background.

CONCLUSION

The study employed a semiotic perspective to recreate bamboo slips from Gansu as layered symbolic systems of form, material, and narrative, before proposing the SFS model to assist their translation into stationery design. By merging Saussure's binary theory, Barthes' "myth," and Eco's sign classification, the study expanded semiotic analysis beyond flat visual conversion to a multidimensional framework. The findings demonstrate that cultural symbols can be systematically re-coded to maintain authenticity while adapting to modern usability, providing a methodological contribution to the sustainable design of heritage artifacts.

The case studies of a brush holder and an ink stone showed that symbolic translation can cause functional innovation while retaining cultural meaning. CNC carving, bamboo fiber composites, and other material developments enabled the calligraphic and structural characteristics of bamboo slips to be incorporated into modern goods. User feedback confirmed that symbol recognition and narrative intensity were the most powerful generators of cultural identity, particularly among younger audiences who responded favorably to NFC and AR interactions. These findings demonstrate that the SFS paradigm may reconcile cultural authenticity with modern design requirements.

Despite the model's obvious virtues, obstacles remain in expanding user coverage, lowering production costs, and adapting the system to different cultural locations. Future research should look into larger demographic groupings, generative AI for narrative personalization, and distributed production to reduce technological constraints. The living legacy of bamboo slip culture is ultimately dependent on incorporating symbolic translation into an ecological chain of cultural perception, technological empowerment, and user co-creation, which ensures both historical continuity and inventive progress in cultural sectors.

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