LEX LOCALIS-JOURNAL OF LOCAL SELF-GOVERNMENT
ISSN:1581-5374 E-ISSN:1855-363X
VOL. 23, NO. S4(2025)

ARCHITECTURAL CRAFTSMANSHIPWISDOMOF PRASAT PHANOM RUNGTOWARD THE DESIGN OFHYPOTHETICAL RECONSTRUCTION TO PROMOTE LEARNING

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Abstract

Phanom Rung Historical Park, a remarkable and beautiful ancient Khmer stone sanctuary in Thailand, is a popular destination for both domestic and international tourists. Its architecture showcases diverse elements from various periods, with the construction of each section employing distinct techniques and methods derived from ancient Khmer craftsmanship. Therefore, to promote learning about these technical traditions and artisanship through hypothetical visualizations and souvenir products, thereby adding value to the tourist attraction in line with government policies, this research aims To study the architectural craftsmanship wisdom of Prasat Phanom Rung. And to design Hypothetical reconstructions and souvenirs to promote learning based on the architectural craftsmanship wisdom of Prasat Phanom Rung.

This research employs a mixed-methods approach, integrating both qualitative and quantitative data collection. Qualitative data was gathered through field surveys and purposive sampling interviews with two experts/practitioners each, specializing in ancient Khmer architectural techniques and forms. The interview data was then cross-analyzed with information from other sources to inform the design of hypothetical visualizations.For the design of souvenir products, a dedicated design process was followed, incorporating insights from three purposively sampled souvenir design experts. These experts evaluated various souvenir concepts to identify the most suitable design for prototype development. Subsequently, quantitative data was collected from a sample of 399 tourists at Phanom Rung Historical Park, utilizing accidental sampling, to assess their satisfaction with the developed souvenir prototypes. The survey data was analyzed using descriptive statistics, specifically mean, standard deviation, and percentage, to interpret the findings.

The study of architectural craftsmanship at Prasat Phanom Rung reveals distinctive forms, techniques, and assembly methods. These include the adaptation of mortise and tenon joint techniques from woodworking to stone construction, various stone joining and layering techniques, and methods for transferring weight from upper to lower sections.The design of hypothetical reconstructions and souvenir products, aimed at enhancing learning about these technical traditions at Phanom Rung, significantly increased tourists' understanding of the diverse techniques employed in the castle's construction. Furthermore, the prototype souvenir products effectively reflected the unique identity and architectural craftsmanship wisdomof Phanom Rung, demonstrating high acceptance and demand for products that align well with the tourist attraction. The overall mean satisfaction score from the sample group was 4.62, with a standard deviation of 0.10.

This research highlights the value and importance of its findings, primarily in two key areas:Firstly, for tourists and interested individuals, this study deepens their understanding of the technical architectural craftsmanship wisdom at Prasat Phanom Rung. It can also serve as an inspiration for further study or as a case study for exploring Khmer architecture at other sites.Secondly, for relevant agencies and interested entrepreneurs, the findings offer a guideline for designing and developing other souvenir products that are consistent with local tourist attractions. Furthermore, the research can be utilized as a promotional tool to attract tourists disassemblable souvenir productsand stimulate the local economy within the tourist area. This aligns with government policies aimed at promoting creative tourism by leveraging cultural capital in the form of traditional wisdom and craftsmanship.

The aforementioned research highlights the intergenerational transfer of knowledge, stemming from the application of various techniques and methods by ancient Khmer artisans. This led to the development of engineering wisdom, evident in the construction of architectural structures at Prasat Phanom Rung. This accumulated knowledge subsequently informed the creation of a hypothetical model and the further development of disassemblablesouvenir products. These products are designed to promote learning by showcasing distinctive and iconic engineering wisdom and techniques unique to Prasat Phanom Rung.Based on the foregoing, the research management plan can be summarized in the following diagram.

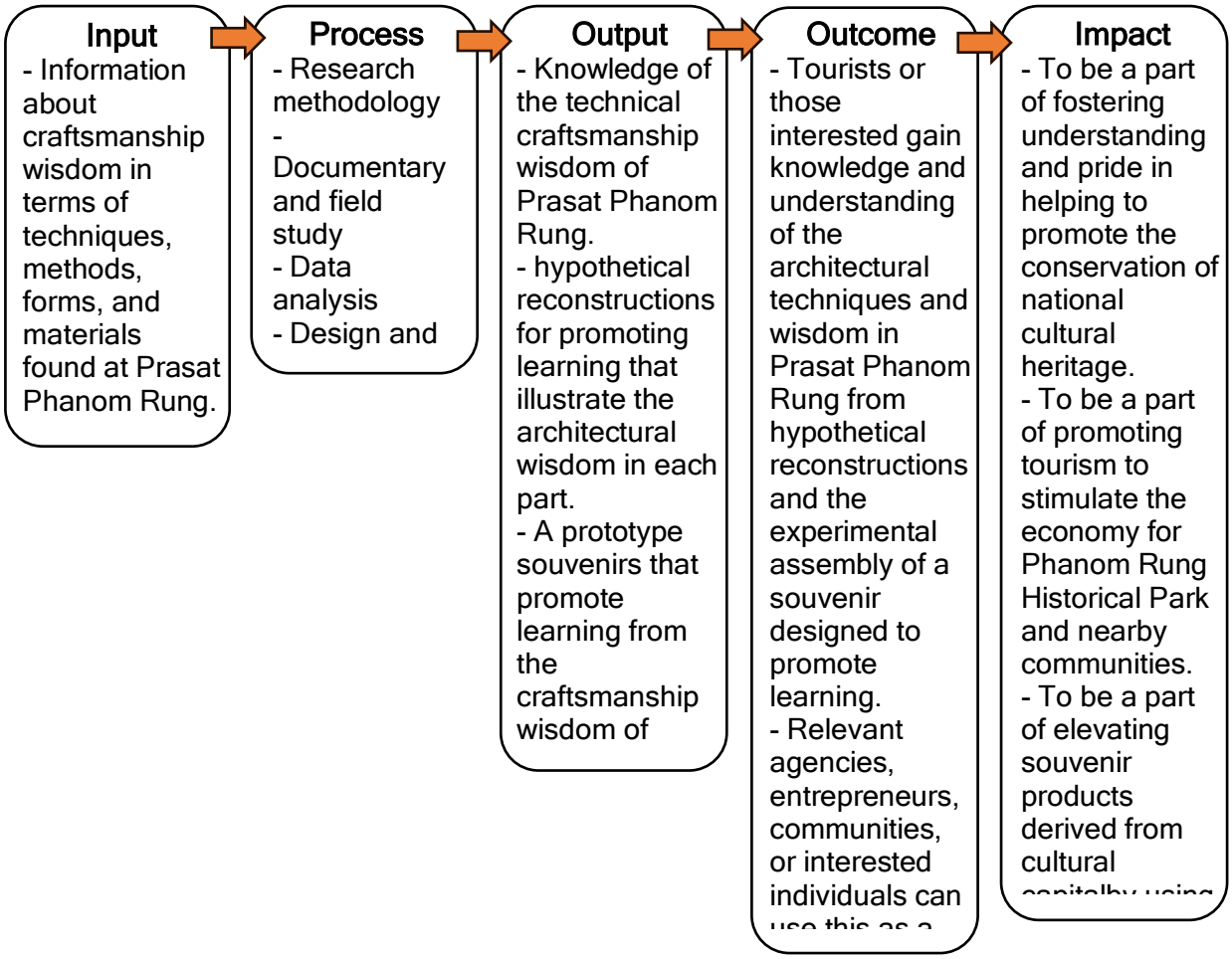


Figure 1 Process managementplan
(**Source:**Kittisak Tammasakchai, 2025)

Keyword : Craftsmanship wisdomwisdom, Prasat Phanom Rung,Hypothetical reconstructions, Souvenirs that promote learning

Introduction

According to the 13th National Economic and Social Development Plan (2023-2027), a key objective is to enhance tourism by developing and promoting activities, goods, and services that draw on unique local identities. This strategy is designed to create added value, attract visitors to diverse destinations, and ensure a wider distribution of economic opportunities. This vision is consistent with the Third National Tourism Development Plan (2023-2027), which aims to elevate tourism by meeting the demands of specific traveler segments through creative, proactive marketing and the use of modern technology.Aligned with these national strategies are the goals for tourism development in the Northeastern (Isan) region. This area is particularly distinguished by its ancient Khmer civilization attractions, which are most concentrated in the lower Isan provinces of Nakhon Ratchasima, Buriram, Surin, Sisaket, and Ubon Ratchathani. The development plan seeks to leverage this unique cultural heritage to create products that appeal to tourists, with a special focus on the renowned Phanom Rung Historical Park in Buriram's Chaloem Phra Kiat District.

As one of Thailand's most significant ancient Khmer sites, the park attracts both domestic and international visitors. Its structures, featuring Baphuon and Angkor Wat-style art, were built and expanded from the 15th to the 18th Buddhist centuries. The buildings are

constructed from a combination of baked clay brick, sandstone, laterite, and volcanic rock, with some architectural elements showing evidence of integrated wooden components. The site is a rich resource for the study of history, art, and architecture. The construction techniques—particularly the methods used for laying and joining different types of stone—demonstrate the exceptional ingenuity and architecturalcraftsmanship wisdom of ancient Khmer artisans.These construction methods often spark curiosity among visitors, who frequently ask how such monumental temples were built.

Based on these observations, a research project was conceived to enhance learning experience and tourism at PrasatPhanom Rung. The study focuses on documenting the specific technical and artistic craftsmanshipwisdom found in the sanctuary's structures. The findings will be used to create hypothetical reconstructions and Souvenirs that promote learning that highlight Prasat Phanom Rung unique and significant joining techniques.

This research will allow tourists to gain a deeper understanding of construction forms and techniques through Hypothetical reconstructionsand hands-on assembly of souvenir products. These products will provide a clear and detailed look at how the various sections of the temple connect. This promotes the creation of souvenir products that align with the Phanom Rung Historical Park, truly meeting the needs of tourists. Furthermore, the research findings can serve as a valuable guideline for both public and private organizations, as well as interested individuals, to study and develop cultural-based souvenirs. This approach ensures the maximum and most appropriate use of cultural capital for sustainable development, in accordance with the national plans mentioned above.

ResearchObjectives

1. To study the architectural craftsmanship wisdom of Prasat Phanom Rung.

2.To design Hypothetical reconstructions and souvenirs to promote learning based on the architectural craftsmanship wisdom of Prasat Phanom Rung.

ResearchMethods

This research employs a mixed-methods approach, integrating both qualitative and quantitative methodologies. Data collection will be conducted through a multi-faceted process: a literature review of documents, academic texts, and existing research, as well as fieldwork involving interviews and surveys of the population and specific sample groups.

For the expert group, we will use a purposive sampling method to select two individuals with extensive knowledge, expertise, and experience in the restoration of Khmer stone temple in Thailand. The research tool will be an interview questionnaire focusing on topics such as the methods of temple construction, as well as the techniques of stone-laying and joining found at Prasat Phanom Rung. The data gathered from these interviews will then be compared with information from existing academic literature and research. The findings will be presented using a descriptive analysis approach, supplemented with illustrative images and captions to synthesize the key knowledge gained.

The knowledgeable individuals were divided into two groups:

Group 1: Experts in history and ancient Khmer architecture. This group consisted of two individuals. A purposive sampling method was used for their selection. The research tool was an interview guide, which focused on the forms, components, and various techniques related to ancient Khmer architecture. The data gathered from these interviews was then compared with information from existing literature. The findings were presented using a descriptive analysis, supplemented with illustrative images and captions to synthesize the acquired knowledge.

Group 2: Experts in educational products and souvenir design. This group consisted of three individuals. They were also selected using a purposive sampling method. The research tool was a survey questionnaire that sought their opinions on the design Souvenirs that promote learning based on the architectural craftsmanship wisdom of Prasat Phanom Rung. Statistical analysis was performed on the survey data to determine the mean and standard deviation. The findings were presented using a descriptive analysis, supplemented with images and tables.

related individuals' group as a sample group of tourists visiting Prasat Phanom Rung. The sample size was determined to be 399 people, calculated from a total tourist population of 148,052 in 2024 using the Taro Yamane formula at a 95% confidence level with a ±5% margin of error. A convenience sampling method was used, and the research tool was a questionnaire designed to assess participants' perception of and satisfaction with a prototype souvenirs that promote learning based on the architectural craftsmanship wisdom of Prasat Phanom Rung. Statistical analysis was performed on the questionnaire data to calculate the percentage, mean, and standard deviation. The findings were presented using a descriptive analysis, supplemented with illustrative images and tables.

Research Results

Issue 1: Analysis of the architectural craftsmanship wisdom at Prasat Phanom Rung for the design of hypothetical reconstructions that promote learning.

This study involves extracting knowledge related to craftsmanship techniques wisdom, based on specific criteria including: the characteristics of shape and form, materials and surfaces, construction techniques and methods, functionality, and the underlying construction concepts as currently seen in the various architectural structures of Prasat Phanom Rung. These structures include the main sanctuary, Prang Noisanctuary, two brick sanctuaries, two Bannalai (libraries), galleryand Gopura(The entrance building), and the PlapPlueangKhrueangpavilion (Royal changing room). Therefore, the researcher will present a summary and examples of the analysis of this knowledge and the creation of hypothetical reconstructions to promote learning, which will demonstrate significant and prominent craftsmanship wisdom, as follows:

Door frames are one of the most foundational components in Khmer stone templeconstruction. Building begins with the structure's base, after which the door frames are installed in their designated positions. The remaining sections are then constructed, all the way to the roof or pinnacle. pinnacleThe door frames themselves are made from four pieces of sandstoneconsisting of two vertical and two horizontals.

The architectural craftsmanship wisdomfound in the door frames at Prasat Phanom Rung reveals the use of a grooving and tenon joinery technique, similar to that used in modern-day wooden door jambs. This technique is categorized into three main styles:

Style 1: The half-lap mortise and tenon joint (Figure 2a.); features a 45-degree miter cut on both the front and back. The upper and lower horizontal jambs have a central tenon that is used to connect to the vertical door jambs. This type of mortise-and-tenon joinery is found in The main sanctuary, galleryand Gopura, and the royal changing room.

Style 2: The Half-lap joint (Figure 2b.); features a 45-degree miter cut on the front face of the jamb, while the back remains straight. The upper and lower horizontal jamb pieces have a deep notch cut nearly halfway into the jamb to fit into the vertical door jambs. This type of mortise-and-tenon joinery is found in the main sanctuary, galleryand Gopura, Prang Noisanctuary, and the door frames of the royal changing room. Notably, both of these craftsmanship wisdom techniques were also used to construct the window frames throughout Prasat Phanom Rung.

Style 3: The single-tenon shoulder joint (Figure 2c.);the upper and lower horizontal jambs are carved with a deep, rectangular groove, while the two vertical jambs are cut into rectangular-shaped tenons to be inserted and secured into the horizontal pieces. This type of mortise-and-tenon joinery is found in the two brick sanctuaries and in some of the Gopura door frames.

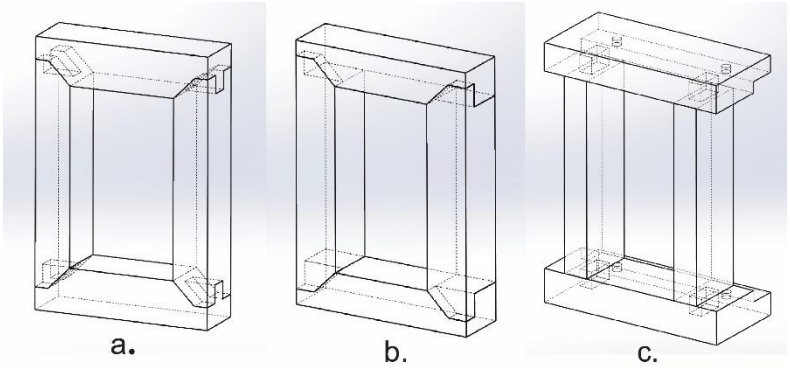


Figure 2 Shows the techniques of penetration of doors and windows in all 3 models.
(**Source:** Kittisak Tammasakchai, 2025)

The upper horizontal jambs of styles a. and b. feature a scene angle shoulder designed to support the lower section of the lintel. This helps to support and distribute the weight of the pediment onto the lintel. Additionally, this feature ensures that the colonette supporting the lintel do not experience excessive load, which could otherwise lead to their fracture and collapse.

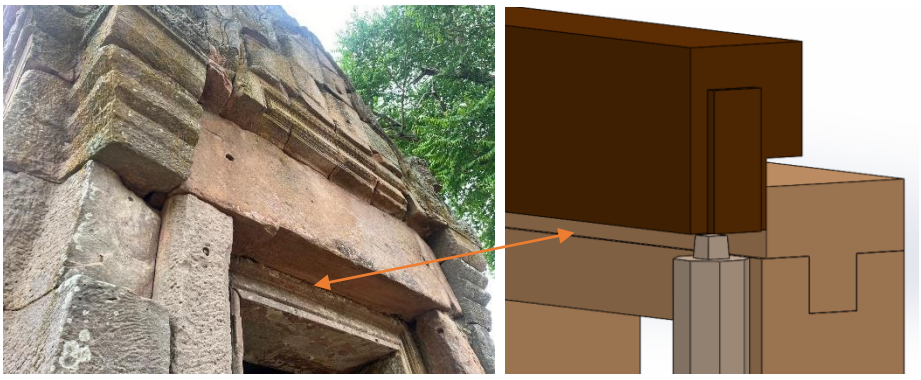


Figure 3 The architectural design incorporates a sophisticated technique to accommodate and distribute the structural load on the upper door frame and the lintel.
(**Source:** Kittisak Tammasakchai, 2025)

Furthermore, a technique similar toThe single-tenon shoulder joint has been found in other structural components. These include: the tenon joint between the Colonette and the lintel (Figure 4d.); the tenon joint between the Naga bridge and the columns supporting it (Figure 4e.); the tenon joint between the Nang Riang pillars andtheir bases (Figure 4f.); and various decorative elements, such as the tenon joint between the small stone columns aligned

(Barali) and the curved roof ridge, as well as the tenon joint between the window balusters and the upper and lower window frames.

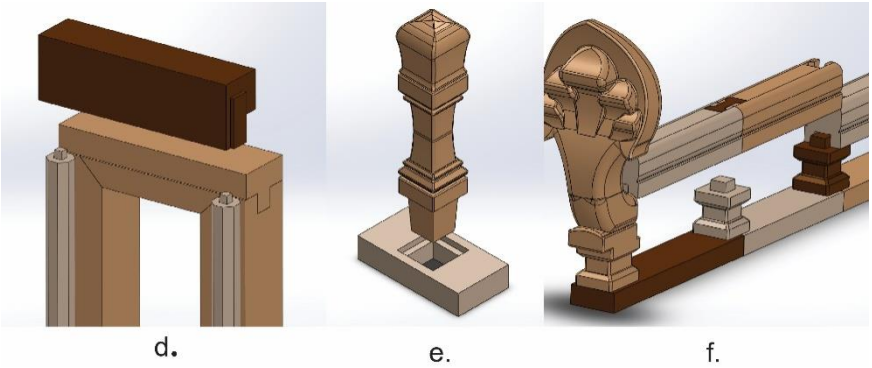


Figure 4 Demonstrate the wisdom of single-shoulder joint techniques in other parts. (**Source:** Kittisak Tammasakchai, 2025)

A technique based on the triangular principle was used to help bear and distribute the downward load from above. This method involves a unique way of stacking stones above the inner door frame of the garbhagriha (sanctum) on all four sides of the main sanctuary. This specific form is very rarely seen in Thailand.

Figure 5 Demonstrates a wisdom technique to help receive and transfer weight over the door frame using the triangle principle.
(**Source:** Kittisak Tammasakchai, 2025)

The wall construction technique involved chiseling each stone with a right-angled recess to support the next layer. Similar to a rabbet joint in woodworking, this method prevents the stones from shifting sideways, working in conjunction with the downward pressure from the stones in the layer above (Figure 6 g.). At the corners of buildings, a technique of alternating, interlocking stones was used. The weight of the stones above presses down on them, which also keeps them from shifting easily (Figure 6h.).

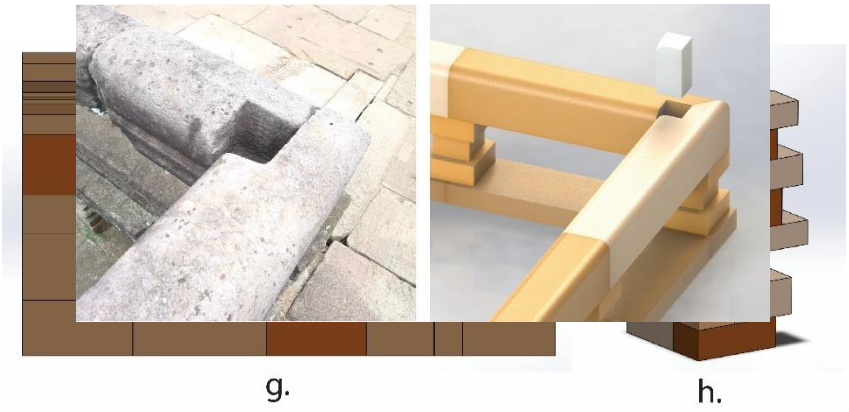


Figure 6 Demonstrate techniques for building walls or walls and building angles. (**Source:** Kittisak Tammasakchai, 2025)

In addition to the stone-chiseling techniques mentioned earlier, the method of driving stone wedges into each wall course was also used to tightly compress the stones within that row. This technique is similar to one used in woodworking (Figure 7 i.). Furthermore, in some parts of the structures, I-shaped iron clamps or other shapes were used to connect stones and provide additional strength to those sections (Figure 7j.).

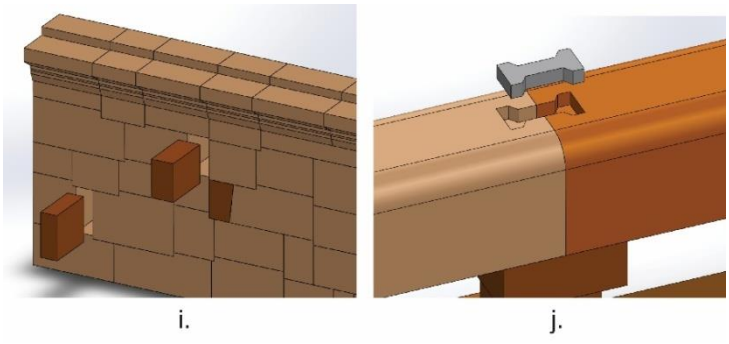
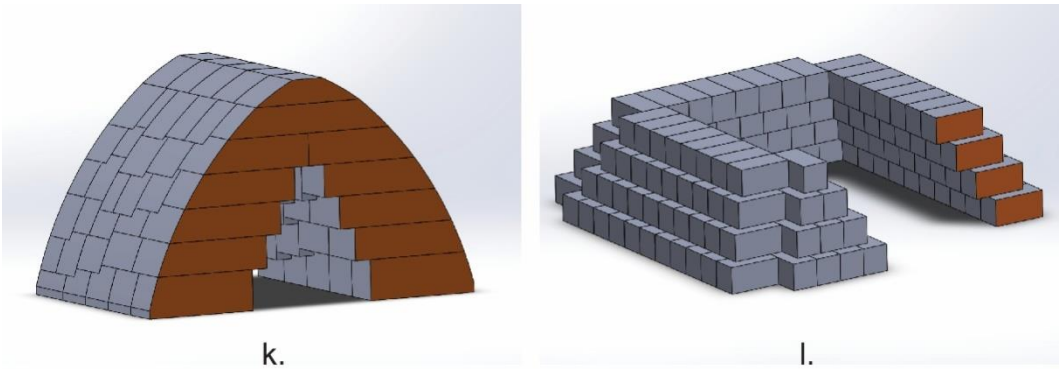


Figure 7 Demonstrate the wisdom of using stone wedges and I-shaped iron. (**Source:** Kittisak Tammasakchai, 2025)

Another form of stone-to-stone connection technique was discovered at the corner joint of the Naga railingat the eastern Gopura entrance. This joint shows evidence of using stone wedges hammered in to connect the stones and provide strength. Notably, the joinery techniques used at the corners of all three sections of the Naga railing differ, demonstrating the diverse concepts and methods used by ancient Khmer artisans.

Figure 8 Demonstrate the wisdom of using stone wedges at right angles of bridge railings.



(**Source:** Kittisak Tammasakchai, 2025)

The corbel arch constructiontechnique was used for both the curved roof (Figure 9k.) and the tiered, prang-shaped roof (Figure 9l.). For both styles, each rectangular stone was laid so it projects slightlyno more than one-third of the stone's lengthbeyond the stone below it. This stacking process was repeated continuously until the stones met at the top.

Figure 9 Demonstrates the wisdom of the technique of building overlapping stones for curved roofs and castle-shaped roofs in layers.

(**Source:** Kittisak Tammasakchai, 2025)

Ancient Khmer temple construction utilized the stone joining techniques previously described in conjunction with a dry-masonry technique. This method involved grinding the joining surfaces of two stones to a smooth finish with the aid of water. The resulting fine dust would mix with the water to create a slurry that, upon drying, caused the two stones to bond tightly together. This demonstrates the knowledge and skill of ancient Khmer artisans. In addition to the aforementioned wisdom, it also highlights their advanced engineering principles, from site surveying and the selection of stone materials to the use of various tools for moving massive stones. The entire construction process, from the foundation to the temple's pinnacle, was systematically defined and planned. These methods were the result of accumulated experience passed down through generations, and some of this architectural craftsmanship wisdomis still visible today.

Issue 2:Analysis and design of souvenirs that promote learning based on the architectural craftsmanship wisdom of Prasat Phanom Rung, focuses on creating products

that highlight the distinctive and iconic architectural elements of the monument. The core objective is to design souvenirs that can be assembled and disassembled, thereby demonstrating the ancient techniques of stone-laying and interlocking used in the construction. This allows tourists to use the souvenirs as a study tool, enabling them to compare the models with the actual structures at the historical site.

The design process follows three distinct approaches:

Approach 1: Office and Stationery Souvenirs. This category includes functional items such as a pencil sharpener, a memo board, a coaster, a phone stand, a pen holder, a calendar, and a storage box.

Approach 2: Functional and Decorative Souvenirs. This approach features products like a 3D photo frame set, a lamp set, and a clock set.

Approach 3: Artistic and Decorative Souvenirs. This final approach focuses on replicating specific, prominent architectural sections of the temple, including the eastern entrance Mandapa Archway set, the causeway and Nang Riang pillarsset, the first fection of the Naga bridge set, and the Garbhagriha set of the main sanctuary.Subsequently, the researcher drafted the product design for evaluation by design experts.

Figure 10 Souvenir of the draft product, Form 1
(**Source:** Kittisak Tammasakchai, 2025)

Figure 11 Souvenir of the draft product, Form 2
(**Source:** Kittisak Tammasakchai, 2025)

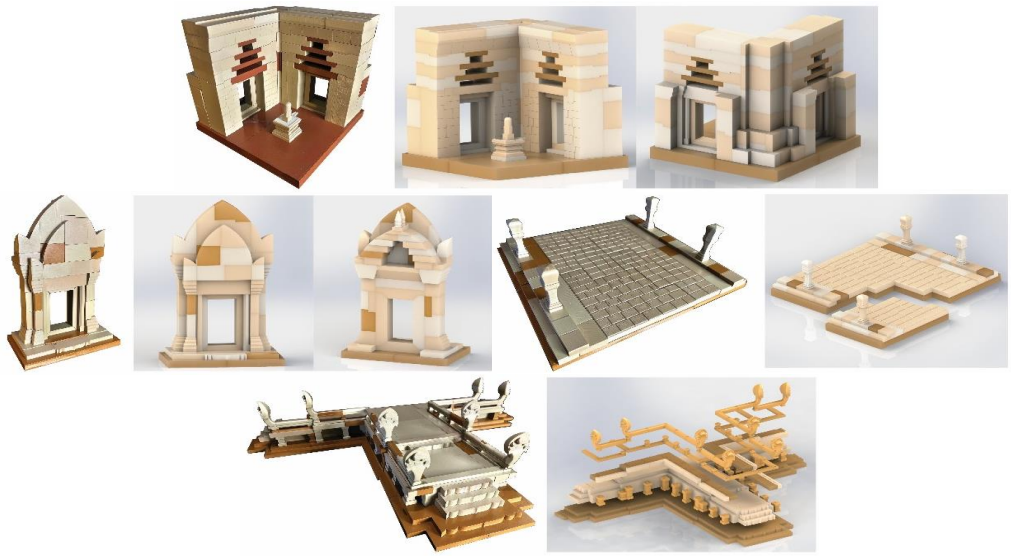


Figure 12 Souvenir of the draft product, Form 3
(**Source:** Kittisak Tammasakchai, 2025)

Following the evaluation of three preliminary product designs by design experts, the results indicate that Prototype Set 3 is the most suitable for further refinement and development into a final prototype. This conclusion is supported by an overall average score of 4.64 and a standard deviation of 0.27. Based on this expert feedback, the selected design was then developed and produced as the final prototype for the souvenirs that promote learning series, the prototype will subsequently be exhibited to the target audience for a satisfaction assessment.

Figure 13A product prototype for souvenirs that promote learning from the craftsman wisdom of Phanom Rung Castle.
(**Source:** Kittisak Tammasakchai, 2025)

Figure 14 Satisfaction assessment of souvenir product prototypes for promoting learning from the craftsman wisdom of Phanom Rung Castle from a sample group of tourists
(**Source:** Kittisak Tammasakchai, 2025)

A survey of 399 tourists at Prasat Phanom Rung was conducted to assess satisfaction. The sample consisted of 121 males (30.33%) and 278 females (69.67%). Of the respondents, 95 (23.80%) resided in Buriram Province, while 304 (76.20%) were from outside the province. The overall satisfaction score was very high, with a mean of 4.62 and a standard deviation of 0.10.

Regarding the pre- and post-experiment of the souvenir set designed to promote learning from the architectural craftsmanship wisdom of Prasat Phanom Rung, to what extent did the participants understand the craftsmanship, specifically the techniques and methods for stone-laying and interlinking key architectural components of the temple?Results showed that before the experiment, the sample group had a low level of understanding, with a mean score of 1.84 and a standard deviation of 0.71. However, following the hands-on assembly of the souvenir set, the group's understanding increased to the highest level, with a mean score of 4.67 and a standard deviation of 0.56.

Results from the satisfaction assessment and qualitative feedback from the sample group indicated that most participants gained a significant increase in knowledge and understanding of the architectural craftsmanship wisdom techniques used in the construction of Prasat Phanom Rung. This finding is consistent with the survey question about the souvenir's ability to clearly reflect the conceptual and technical aspects of stone assembly and arrangement. The mean score for this item was 4.59 with a standard deviation of 0.52, indicating a very high level of satisfaction.

On the issue of feedback from the sample group revealed a strong demand for relevant agencies or entrepreneurs to mass-produce and sell the souvenir prototype at Phanom Rung Historical Park. This is consistent with the survey results, which showed a very high level of satisfaction regarding the souvenir's suitability for commercial production, its compatibility with the tourist site, and its ability to meet tourist needs. The mean score for this item was 4.79 with a standard deviation of 0.40.

Conclusion and Discussion

Based on this research, the construction of Prasat Phanom Rung and other ancient Khmer stone temple involved the systematic arrangement and assembly of various types of bricks and stones, from the foundation to the roof and pinnacle, a testament to the artisans' wisdom in adapting woodworking methods to stone. These techniques included cutting grooves, employing mortise and tenon joints, and reinforcing with I-shaped iron clamps. Furthermore, engineering principles were applied to effectively distribute vertical loads, particularly in the construction of archways and roofs. This finding aligns with NuanlakWatsantachad (2010) description of corbelling, where each horizontal layer of stone extends slightly outward. This structural method effectively bears vertical loads, as increased compression leads to reduced tensile stress, ultimately enhancing the structure's overall load-bearing capacity.

In addition, the construction involved the use of a Triangle Principal technique to help distribute vertical loads from the top down. This is particularly prominent and clearly visible above the door frame of the Garbhagriha of the main sanctuary.This finding is consistent with the researchof Chea Ratha, Masao Katagiri, and Yutaka Shigeda (2009), who describe the critical elements for bearing and transferring weight from the roof to the walls on either side

of the doorway in Khmer stone temple. These key components include bracing techniques and the methods used to connect structural elements such as beams, columns, and door frames.

The stone-laying in various sections of Prasat Phanom Rung architecture employed systematic dry-masonry techniques to join each stone, a practice common in other ancient Khmer temples. This is consistent with SorachetWorakamwichai (2008), who notes that a key technique in Khmer stone temples construction was ensuring a perfectly flush fit between bricks or stones by polishing their surfaces before stacking them, which resulted in a durable and long-lasting bond. Evidence also indicates the use of I-shaped iron clamps to bind or join certain stones for enhanced structural stability. This is further supported by Hongnam Kim (2020), who describes the global use of iron clamps to connect or fasten stone blocks, which provides reinforcement for stone or brick construction. This practice demonstrates an evolution in the technical management of stone structures, a phenomenon observed worldwide.

Based on the architectural craftsmanship wisdom techniques found at Prasat Phanom Rung, it's evident they bear similarities to the construction methods of other Khmer stone temple. This unique style demonstrates the transmission of craftsmanship and wisdom. However, these forms and techniques vary across different regions and eras, primarily due to contextual factors such as the limitations of available construction materials, the skills of the artisans, and the specific demands of the patrons or commissioning authorities.This aligns with the findings of WirojShewasukthaworn (2018), who discusses the seamless integration of various materials in Khmer temple construction. This integration reflects the transmission of artisan techniques and skills, as well as the adaptation and development of architectural forms to suit both function and the environment. Furthermore, it is consistent with VannipaSuneta(2009) research on the continuous evolution of Khmer architectural forms, which is fundamentally based on changes to the temple's overall form and plan.

The design of hypothetical reconstructions of various parts of Prasat Phanom Rung, the researcher gathered data from on-site fieldwork. This data was compared with documented sources and historical photographs that revealed the forms and artisan techniques used in the construction of Phanom Rung and other ancient Khmer temples. This was done to analyze the architectural structure's artisan wisdom and find correlations among its components. This approach is consistent with Anuspong Kraikriengsri (2018), who states that studying hypothetical models of temple complexes, in both their original and complete states, can clarify architectural forms, the use of space in accordance with religious beliefs, and the transmission of influences from one location to another.

Moreover, the creation of hypothetical reconstructions of Prasat Phanom Rung architectural sections can enhance tourist knowledge and understanding of the various construction techniques used in each part. Also, these reconstructions can serve as a case study for artisan wisdom in other ancient Khmer architectural sites. This aligns with Hawa Wongpongkam (2023), who states that creating virtual reconstructions through an application generates knowledge for studying the forms and content of ancient Khmer architecture. This, in turn, leads to a greater understanding of the monument among tourists and serves as a means of promoting cultural tourism.

To design souvenirs that promote learning based on the architectural craftsmanshipwisdom of Prasat Phanom Rung. aims to demonstrate the techniques and methods for connecting architectural structures through disassemblable models. This approach allows tourists to learn about the artisan wisdom through the hands-on process of assembling each component. The products are designed by incorporating prominent architectural features that are easily recognizable to tourists. This is consistent with

Guangzhou LI (2022), who argues that in cultural product design, integrating local identity makes a product more distinct and appealing. This demonstrates the value of culture through the product's use and can have an emotional impact on the consumer.

The results from the satisfaction assessment of the souvenirs that promote learning, based on the architectural craftsmanshipwisdomof Prasat Phanom Rung, indicated a high level of acceptance among the tourist sample. The product was praised for its perceived novelty, which distinguishes it from other souvenirs typically available at the site. It was deemed suitable for commercial production throughout the year, as it aligns with the tourist destination and meets visitor demand. The souvenir facilitates interactive learning about artisan techniques during the assembly process and clearly reflects the unique identity and concepts of craftsmanship found in the architectural structure. Furthermore, the product helps foster a sense of understanding and pride in supporting the conservation of national cultural heritage, and it also serves to inspire tourists and interested individuals to pursue further study.This aligns with BenyadaJongpranee (2020), who states that embedding information into a souvenir product can create greater interest and differentiation than general merchandise. This strategy helps tourists identify the product's origin, focusing on fostering consumer value and creating a novel experience.Furthermore, this is consistent with Anat Siripithakul and YuwadeePhrongtarapong (2023), who argue that adapting local identity to suit modern souvenir products can stimulate consumption and encourage the development of a wider variety of product forms.

The findings of this research can be leveraged to apply the study and development approach to create souvenir products from each locality's cultural capital, for the benefit of interested agencies, communities, and entrepreneurs. The exhibition of the souvenir prototype at Phanom Rung revealed significant interest from both local agencies and private sector entrepreneurs in its potential for commercial production and sale.This commercialization would serve to promote and stimulate the local tourism economy, aligning with government policies that foster job creation, sustainable livelihoods, and equitable income distribution. Therefore, based on the research process of developing hypothetical reconstructions and souvenirs that promote learning from the architectural craftsmanshipwisdomof Prasat Phanom Rung, the researcher has formulated a conceptual framework to serve as a guideline for future studies and the creation of products from cultural capital.

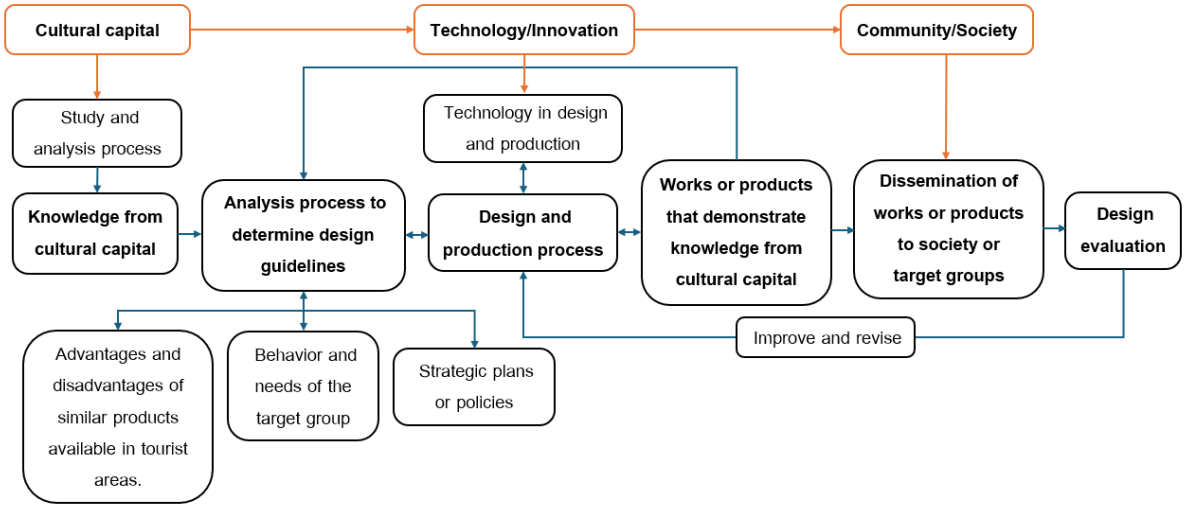


Figure 15 Conceptual framework for product development from cultural capital (**Source:** Kittisak Tammasakchai, 2025)

References

AnuspongKraikriengsri. (2018). *A Reconstruction of Prang Pu Ja, at Na Chung Kiri, Kirimas district, Sukhothai province.* Art and Architecture Journal Naresuan University, 9(2), 170-181. (In Thai)

Anat SiripithakulandYuwadeePhrongtarapong. (2023). *Utilizing Design Innovations to Develop Souvenir Products, Relying on Linking Secondary City Identities to Promote Tourism in Secondary City Provinces.* Faculty of Architecture and Design, Rajamangala University of Technology Phra Nakhon. (In Thai), Retrieved 9 February 2567, from http://repository.rmutp.ac.th/handle/123456789/4037

BenyadaJongpranee. (2020). *The Meanint and Attitude Towards Souvenir Products Affect The Buying Decision Behavior of Thai Tourist In Bangkok.* Master Thesis,College of Management Mahidol University. (In Thai)

Chea Ratha, Masao Katagiri, Yutaka Shigeda. (2009). *A Study on the Development Process of Structural Techniques in Khmer Brick Architecture: A Focus on the Upper-part of Entrance of the Remains Brick Shrines from Pre-Angkor to the Beginning of Angkor Period, from the Early 7th to the Middle of the 10th Centuries*.Journal of Architecture and Planning, Architectural Institute of Japan, 73, 1875-1884.(In Japan),Retrieved9 February2567, fromhttps://www.researchgate.net/publication/240803560_A_STUDY_ON_THE_DEVELOPMENT_PROCESS_OF_STRUCTURAL_TECHNIQUES_IN_KHMER_BRICK_ARCHITECTURE

Guangzhou Li. (2022). *Emotional design of traditional Chinese cultural creative products based on user Demand*. Doctor of Philosophy DESIGN, Silpakorn University, Thailand. (In Thai)

Hawa Wongpongkam. (2023). *The Architectural Style of Religious sites in the Khmer Civilization in Khon Kaen Province, to create an Application to Promote Cultural Tourism.* Journal of Legal Entity Management and Local Innovation, 9(3), 377-393. (In Thai)

Hongnam Kim. (2020). *A Study of Stone-joint Metal Clamps in China and Korea during the 6th-8th Centuries*.The Journal of the Silk Road House, 18, 81-108.(In American), Retrieved30September 2566, from https://edspace.american.edu/silkroadjournal/wp-content/uploads /sites/984/2021/03/The-Silk-Road-vol.-18-2020-low-resolution-1.pdf

NuanlakWatsantachad. (2010). *Collapse of Khmer stone architecture: was it caused by the lack of structural knowledge or extrinsic environmental factors?*. NAJUA : Architecture, Design and Built Environment. Faculty of Architecture, Silpakorn University, 25, 427-453. (In Thai)

SorachetWorakamwichai. (2008).*Stone castles and lintels*. Journal of Local Research and Innovation, Buriram Rajabhat University, 3(1), 6-13. (In Thai)

VannipaSuneta. (2009). *Development in Khmer architecture of Thailand 11th to12th century A.D.* Doctoral Dissertation, Ph.D. in Department of Art History, Silpakorn University, Thailand. (In Thai)

WirojShewasukthaworn. (2018). *The Reconstruction of The Three Santuary Towers: Case study of Prasat Pueai-Noi, Khon Kaen Province.* Built Environment Inquiry – BEI, Khon Kaen University, 17(1), 1-21. (In Thai)

Kittisak Tammasakchai. (2025). Figure 1process management

Kittisak Tammasakchai.(2025).Figure 2Shows the techniques of penetration of doors and windows in all 3 models.

Kittisak Tammasakchai. (2025). Figure 3The architectural design incorporates a sophisticated technique to accommodate and distribute the structural load on the upper door frame and the lintel.

Kittisak Tammasakchai. (2025).Figure 4Demonstrate the wisdom of single-shoulder joint techniques in other parts.

Kittisak Tammasakchai. (2025). Figure 5 Demonstrates a wisdom technique to help receive and transfer weight over the door frame using the triangle principle.

Kittisak Tammasakchai. (2025).Figure 6Demonstrate techniques for building walls or walls and building angles.

Kittisak Tammasakchai. (2025).Figure 7Demonstrate the wisdom of using stone wedges and I-shaped iron.

Kittisak Tammasakchai. (2025).Figure 8Demonstrate the wisdom of using stone wedges at right angles of bridge railings.

Kittisak Tammasakchai. (2025).Figure 9Demonstrates the wisdom of the technique of building overlapping stones for curved roofs and castle-shaped roofs in layers.

Kittisak Tammasakchai. (2025). Figure 10Souvenir of the draft product, Form 1

Kittisak Tammasakchai. (2025). Figure 11Souvenir of the draft product, Form 2

Kittisak Tammasakchai. (2025). Figure 12Souvenir of the draft product, Form 3

Kittisak Tammasakchai. (2025).Figure 13A product prototype for souvenirs to promote learning from the technical wisdom of Phanom Rung Castle.

Kittisak Tammasakchai. (2025).Figure 14Satisfaction assessment of souvenir product prototypes for promoting learning from the technical wisdom of Phanom Rung Castle from a sample group of tourists

Kittisak Tammasakchai. (2025).Figure 15Conceptual framework for product development from cultural capital