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RESEARCH ARTICLE

Creation of the Contemporary Wot Musical Instrument from the Wisdom of Isan Musical Instruments

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ABSTRACT

The present study sought to investigate the wisdom of Isan musical instruments, including the wisdom of production and material selection, and to apply this wisdom to design the contemporary "Wot" musical instrument. It was carried out through a mixed-methods approach, combining qualitative and quantitative research. Data were obtained using notes, audio recordings, photographs, surveys, interviews, and questionnaires, and analyzed based on the structural functional theory and design concepts. The results demonstrated that the design of the contemporary musical instrument incorporating the wisdom of Isan musical instruments showed the unique characteristics of the Isan musical instruments, specifically the wisdom of Isan musical instruments. This wisdom must be preserved and developed to adapt to new materials to fulfill the needs of musicians and enthusiasts. To appeal to the market, the shapes used in the production of contemporary musical instruments incorporated the wisdom of Isan musical instruments, used metals to increase durability, and featured new structural designs.

INTRODUCTION

Isan folk music has evolved over a long period, initially imitating natural sounds, such as the forest, rain, wind, the rustling of leaves, and waterfalls. In particular, natural sounds, such as leaves, grass, and bamboo, are imitated with local materials. Simply put, the music evolved from imitation of the sounds of nature such as forests and mountains. This contributed to the creation of more intricate and melodious Isan musical instruments, and those instruments were combined, leading to the formation of folk music bands. The distinctive feature of folk music lies in its inheritance from the past to the present through "oral traditions", characterized by melodies, forms, and styles encompassing a wide range of pitches. This type of musical is typically performed to the accompaniment of musical performances or other forms of performances with the unique musical identity of Isan culture, serving as a medium for showcasing creativity (Polpratom, 1995). This local music has become a treasure trove worthy of preservation. Furthermore, various forms of Serng dances are regarded as distinctively unique performances. Until now, Isan musical instruments have constantly adapted to keep pace with the changing times and the ever-changing tastes and preferences of audiences, as musical tastes have evolved and shifted with each era (Chaithawin, 2006). These instruments are entirely conceived and created by locals using locally available materials, thereby embodying wisdom. New inventions or designs drawing inspiration from the inherited traditional wisdom of Isan musical instruments incorporate the spirit and beliefs of the past to imbue objects with culture. This also assigns new meanings to those objects, which evolve with the ever-changing social trends and technological advancements. Considering this, the researchers attempted to develop methods for creating modern musical instruments by drawing on the local wisdom of Isan musical instruments to retain the unique identity of Isan local craftsmanship.

Hence, the present study focused on designing musical instruments based on the analysis of the Isan people's traditional wisdom. It was to preserve and increase the value of this inherited knowledge as well as to safeguard the unique identity of Isan culture in terms of both performance and physical aspects. The researchers observed several challenges. Among them is production, which requires long-distance travel to procure materials, thereby resulting in significant time and travel expenses. Additionally, the other is financial constraints, including liquidity issues and a lack of skilled labor. To draw upon the traditional wisdom, local craftsmen need to modernize existing equipment while ensuring high standards and precision. Currently, Western music instruments have been integrated into Mor Lam ensembles. Thus, research on the wisdom of Isan musical instruments would contribute to preserving a body of knowledge of Isan music instrument makers, add value, and increase accessibility for enthusiasts of string instruments. It would serve as a collection of knowledge for those interested in Isan musical instruments, which have been relatively understudied.

Purposes of the study

1. To investigate the wisdom of making Wot, including the wisdom of production and material selection, in Rob Muang Sub-district, Nong Phok District, Roi Et Province
2. To apply the wisdom of making Wot in Rob Muang Sub-district, Nong Phok District, Roi Et Province, to design the contemporary Wot musical instrument

LITERATURE REVIEW

1. Overview of the study area

The Northeast covers an area of 105.5 million rai, accounting for 33 percent of the total area of the country, with a population of approximately 18 million people, or 35 percent of the total population. The region is a large plateau, roughly 100-200 meters above sea level. The terrain is generally undulating, sloping from the east, with the Mekong River forming the border between the Lao People's Democratic Republic and the Kingdom of Thailand. Approximately two-thirds of the region consists of the Mun and Chi River basins, which are the major rivers in the area. These rivers originate from the Dong Phaya Yen Mountain range in Nakhon Ratchasima Province and the Phetchabun Mountain range in Chaiyaphum Province, and they flow into the Mekong River in Ubon Ratchathani Province. The remaining one-third of the region in the northern part includes Loei, Udon Thani, Nong Khai, Nakhon Phanom, Mukdahan, and Sakon Nakhon Provinces, where the Phu Phan Mountain range runs from Loei to Mukdahan and Sakon Nakhon. This area also slopes down toward the Mekong River.

Figure 1: Map of the Northeastern Region (Isan)

Source: panteethai.com

2. Knowledge about musical instruments of the Northeast.

The folk musical instruments of the Northeast can be divided into two groups which are: the Lam Khaen Group, and the Lampi Khaen Group (Phu Thai group). The Lam Khaen group is the largest group of people in the Northeast, living in the provinces of Loei, Nong Khai, Nong Bua Lamphu, Udon Thani, Sakon Nakhon, Nakhon Phanom, Chaiyaphum, Khon Kaen, Maha Sarakham, Kalasin, Mukdahan, Roi Et, Yasothon, Amnat Charoen, and Ubon Ratchathani. The Lampi Khaen group (Phu Thai people) is a minority group of the Northeast, scattered in some parts of 5 provinces which are: Udon Thani, Sakon Nakhon, Nakhon Phanom, Mukdahan, and Kalasin. The culture of folk musical instruments of the Northeast, the Lam Khaen group, can be divided as follows:

i. Plucked instruments

Figure 2: Zung (Lyre)

The lyre is a stringed instrument that has existed since 3,000 years before Christ. It was first created in the Middle East and was adopted by Westerners as a model for creating various stringed instruments, such as: The Sumerian lyre, called the Lyre, was widely played by ancient Egyptians and Greeks. In Europe, Africa, and India, it was played to worship the gods with the sound of music that would bring about unity with Shiva. The single-stringed lyre made from a gourd was widely played in the Indochinese peninsula or Asia (Thanit, 1987).

ii. String Instruments

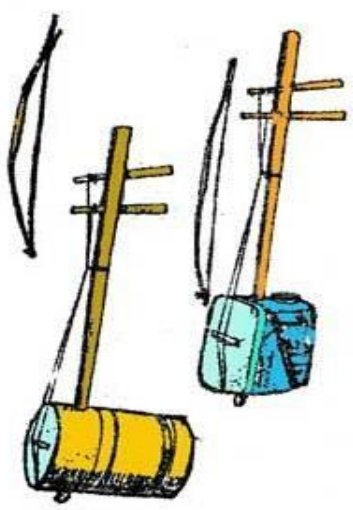

Figure 3: Pail fiddle or can fiddle

Pail Fiddle or Can Fiddle is a fiddle made from a can of various kinds of lozenges. It has two strings, and the pail bow is between the two strings, similar to the bow of the Soprano fiddle and the Alto fiddle of the central region. Nowadays, hardwood or bamboo is popularly used to make the fiddle's body, and the charm of this type of fiddle lies in the sound that sounds like a “Person Crying and Wailing”.

Figure 4: Stripes fiddle or bamboo fiddle

Stripes Fiddle or Bamboo Fiddle is another type of fiddle that was played in the past but is no longer popular. The fiddle is made of bamboo with two strings, approximately 20 centimeters long. There are nodes at both the head and the tail, which are both the body and the handle. The bow of this type of fiddle is on the outside, similar to the three-stringed fiddle of the central region.

iii. Percussion Instruments

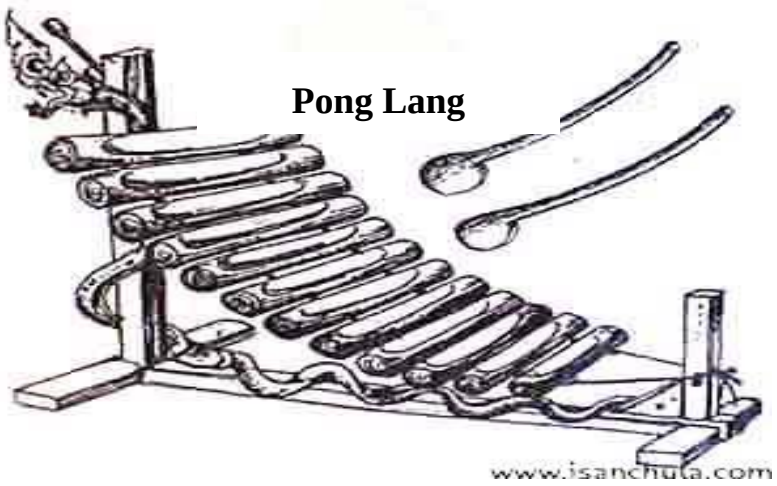

Figure 5: Pong Lang (large brass chime)

Pong Lang is a musical instrument that is a piece of wood, similar to a xylophone, but is hung from a pole and has larger balls. It can play melodies and rhythms. Pong Lang is made of hardwood, and generally has 12 balls, with a pentatonic sound: Do, Re, Mi, Sol, La. The sound positions follow the Pong Lang balls from the lowest sound to the highest sound: Mi, Sol, La, Do, Mi, Sol, La, Do, Mi, Sol. It is usually played with other folk instruments such as the pin, khene, woot, and long drum (Pong Lang band). Or can be played solo. Pong Lang in the past was called "Mak Kling Klom", or "Mak Ter Turn". The word Pong Lang comes from 2 words: Pong and Lang.

"Pong" means something used to tell an omen, such as hitting it late at night to indicate a bad omen, hitting it in the morning before the monks go on alms round to let the relatives and laypeople prepare

to make merit and offer alms, and hitting it in the evening to help people who are lost in the forest find their way back. Because the sound of the pong lang will resonate far and wide.

The word "Lang" means good omen or bad omen. Before it was called Pong Lang, it was called "Krao Lor" or "Kho Lor".

Pong lang is a musical instrument that was developed from Krao Lor or Kho Lor. It is widely played in the northeastern region, especially in Kalasin province because it is the birthplace of Pong Lang. Pong Lang has a similar playing style to the "Ranat Ek", which is to string wooden pieces together into a piece and use sticks to strike a melody. It is hung and played on a pole, stretched on a track, or sometimes tied to the player.

iv. Blow instruments

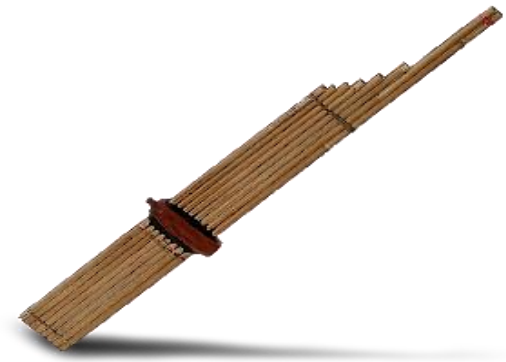

Figure 6: Khaen

Khaen is an ancient musical instrument and a symbol of the Isan people. The Khaen is made of wood and each piece is covered with a lin wood called “Mai Ku Khaen” and then put together at the Khaen Tau. The number of Khaen Ku woods depends on the type of Khaen, which has 4 types: Khaen Hok, Khaen Chet, Khaen Pad, and Khaen Kao.

Figure 7: Wot

The "Wot" is similar to "Bang Fai", and has many sizes, made from "Sang wood" of different sizes. Assembled as a wind instrument, when blowing, rotating the hole to let the wind pass through the holes of different sizes simultaneously, is a folk musical instrument of the Northeast. The Wot is a wind instrument, used to play songs of buffalo herders in Surin Province and nearby provinces, is an ancient musical instrument similar to the one in ancient Greece called "Patpipe".

3. Wisdom knowledge

The word "Intellect", which is equivalent to the English word "Wisdom", has been defined as follows:

Wisdom means knowledge, abilities, skills, beliefs, and the potential to solve problems of humans that have been inherited from the past to the present continuously and are connected throughout the system in every field (Encyclopedia Project for Youth by the royal wish of His Majesty the King).

Wisdom is the growth that humans have created or can be called "Social Heritage" because wisdom is something that humans have received from their ancestors and passed on to their descendants as a guideline for thoughts, feelings, beliefs, behaviors, and behaviors that have been learned.

It has changed continuously as a symbol of the growth and development of the nation, including orderliness, unity, the progress of the nation, and good morality of the people as a system of knowledge, beliefs that groups of people use to interpret experiences and ways of looking at things (Chatthip, 1983). It is a guideline for decision-making. Wisdom is therefore a matter of human thoughts, faith, religious beliefs, intelligence, thoughts, feelings, and behaviors. The state of growth. It evolves into continuous growth, considered a social heritage because humans are heirs who inherit it as a tradition that continues without interruption until it becomes a way of life in society.

Causing happiness and a pattern of life in a community, it is an activity that occurs consistently in organizing social things.

Ekkawit (1997), defined wisdom as knowledge, ideas, beliefs, abilities, and clarity, that groups of people gain from accumulated experiences in adapting and living in the natural environment, and social-cultural environments. It is considered the intellectual product of that group. Witthayakorn (2007), defined wisdom as knowledge, ideas, beliefs, abilities, and clarity of each cultural group that is gained from adapting and accumulating experiences and applied in life to develop themselves and society, or in other words, holistic knowledge in solving problems and developing society.

Local wisdom refers to the background of knowledge or knowledge and experiences that have been passed down or accumulated knowledge. The meaning of wisdom is the method or knowledge that a group of communities, such as in managing the environment for survival, has been passed down. The tangible things that have been seen and known are the products of thought. Wasi P. (2004), gave a view on local wisdom, meaning knowledge, ideas, beliefs, and relationships that the locality has accumulated, passed on, improved, and passed on to each other, appearing as abilities, methods, and tools that can be used to control society and solve problems. Cultural knowledge, sometimes called "wisdom"

"Landscape" means land, and wisdom attached to the land means that each land or environment is different. Humans must create wisdom that is appropriate to live in an area or environment, that has cultural diversity. Sometimes, when talking about local wisdom, it means the culture of the people, which is the foundation of society.

Samart (1993(, divided local wisdom into 2 characteristics:

1. Abstract characteristics, which are worldviews, life views, and philosophy of life. They are about birth, aging, illness, death, and the value and meaning of everything in daily life.
2. Concrete characteristics, which are about specific areas, such as making a living, agriculture, art, music, and handicrafts.

Wisdom also reflects 3 characteristics that are closely related:

1) Relationships with the world and the environment, such as animals, plants, and nature.
2) Relationships with other people who live together in society or communities.
3) Relationship with the sacred, the supernatural, the intangible.

These three characteristics are three dimensions of the same story. Wisdom is therefore the foundation for living.

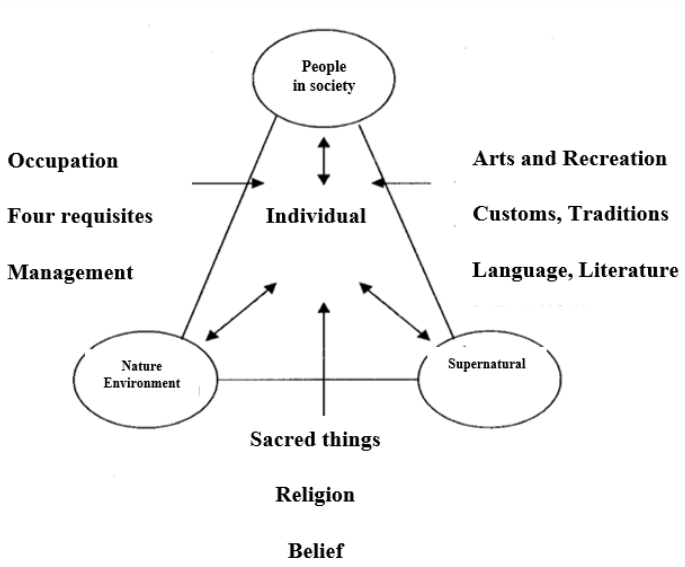

Figure 8: People and the relationship of Thai wisdom.

Source: Samart Chansurn (1993(

4. Knowledge about design

Uthumporn (1998), Pattern refers to the relationship structure between different units or variables. Therefore, the pattern should have more than one dimension and many variables, and the variables are related to each other in a relationship and cause and effect.

Yaowadee (2001) a pattern is a method by which a person conveys their thoughts, understanding, and imagination about any phenomenon or story by using various forms of communication, such as drawings, portraits, charts, continuous diagrams, or mathematical equations to make them easy to understand. At the same time, it can present stories or issues concisely under systematic principles.

5. Knowledge of symbolic design.

Turner was interested in studying religion and ritual, he analyzed ritual symbols in Dembu society as components of social activity. The study of symbols must be done within a cultural environment, to understand what the symbols mean to the members of the society, believing that collecting data from the eyes of the owner of the culture (Emic) alone is not enough. Etic description and analysis are as important as emic data collection.

Turner mentioned the study of symbols and rituals that rituals are a step in the social process involving gestures, words, and objects, performed in a separate place. The purpose is to worship a supernatural being. Rituals are performed when:

1. The beginning of an activity, such as planting, harvesting, or changing from one season to another.
2. The division of the life cycle, such as birth, the transition from childhood to youth, death, etc.
3. Rituals related to illness, are performed to comfort the suffering and misfortune.

Some rituals worship the gods, which are rituals performed by those with social power for the strength and stability of people, animals, and things in the territory. It is a sacrifice to the gods, the spirits of both ancestors and each has its specific practices.

Turner's symbolic concept focuses on the study of beliefs arising from traditional beliefs, religions that groups of people worship, and gods or spirits that are important to the tribe. This symbolic theory focuses on the study of rituals that have social processes related to gestures, words, and objects, which will be performed in a separate place. The purpose is to worship something with supernatural power. Rituals are performed when: 1) starting an activity, 2) dividing the life cycle, and 3) rituals about illness based on beliefs.

Concept of Geertz's symbolic system theory anthropologists see that the symbolic system comes from the process of working in the human mind's cognitive system, which is a deep abstract system. The human thought system will be reflected by human behavior. The most obvious ones are language (Verbal Action) and beliefs or religions that appear in the form of myths (Myth) and sacredness. In addition, regarding the physical behavior of humans or the expression of actions (Body action), the media creator wants to convey his or her thoughts, of people or any group to others to know and understand. Therefore, they must pay attention to the meaning (Encode) of the words or actions to communicate to others so that they can interpret or decode the meaning of those words and actions (Decode) into the symbol system (Symbolism), meaning the interpretation of multiple layers, both the representative meaning and the one that is represented, which may not be very related, but it is a communication of meaning "Freely" or "Arbitrary" by mutual agreement or as a rule between representatives in the same society.

6. Knowledge about trees

The possibility to estimate the age of a tree by counting the number of annual rings it has.

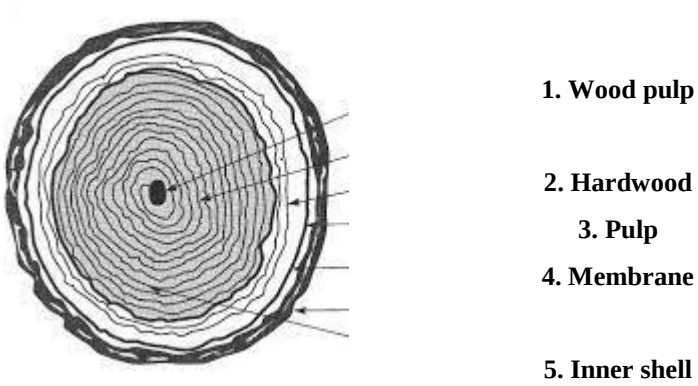

Figure 9: Wooden structure

1. The pith is the part in the middle of the trunk that is very dark in color. When it is old or old (15-20 years), it will start to become hollow, which is a defect in the wood. Therefore, it cannot be used for construction.
2. Heartwood is the part of the cells in the middle of the trunk that has stopped working. That is, it is the part of the sapwood that has expired. Therefore, the heartwood has better mechanical properties than other parts. Therefore, it is suitable for use as construction wood because it gives high strength.
3. Sapwood is lighter in color than the heartwood. It is the part of the cells that still transport water and food. It is also a storage place for food such as starch and sugar. In general, sapwood has the same properties as heartwood, but it is less durable and rots more easily. Therefore, its lifespan is shorter. Therefore, it is a construction wood of lower quality.
4. Cambium is a thin layer next to the sapwood. It is the part of the cells that produces wood and bark, allowing the growth on the sides of the tree to be seen.
5. Inner bark is the part of the cells that are still alive. It is moist and functions to transport cooked food from the leaves to various parts.
6. Outer bark is a part of dead wood cells that acts as a shield covering the trunk.
7. Annual rings are a ring around the core of the wood, which shows the growth of the wood in a year, and this annual ring can tell the age of the wood, etc.

The research concentrated on the wisdom of Isan musical instruments, and their adaptation into contemporary designs. However, the geographical and cultural context of the study area can provide a better understanding of its relevance with instruments as follows:

1. The Isan region in Northeast Thailand is culturally rich, characterized by distinct geographic features, such as the Mun and Chi River basins, and the Phu Phan and Phetchabun Mountain ranges, these elements are central to the cultural context of Isan musical instruments.
2. Groups of Lam Khaen and Lampi Khaen (Phu Thai) are unique to the region, and the deep-rooted cultural practices, such as the use of specific instruments like the Wot, Pong Lang, and Khaen.
3. Material selection and instrument production to produce musical instruments, such as metal or hardwoods are special.
4. Qualitative data, such as interviews and surveys, may have introduced biases though. However, naturally, the Isan people are friendly and humble. Therefore, the structural-functional theory used to analyze the design concepts mostly received the complexity of the cultural and symbolic significance of the instruments across various sub-groups within the region.

RESEARCH METHODOLOGY

The present study adopted a mixed-methods approach, comprising qualitative and quantitative research. The research methodology is described below.

1. Qualitative research was utilized to examine the wisdom of making Wot, covering the wisdom of production and material selection.

1.1 The data was collected through participant observation, which involved field visits to producers and sound quality testing locations. Additionally, notes of the operation obtained information about the surrounding environment. Observation was employed to gather information about both groups of participants, their practices, challenges, and factors for improvement.

1.2 Field surveys were carried out to obtain the data through audio recording and photographing during field visits, including:

i. Photographs of Isan musical instruments.
ii. Photographs of the creation process of the instruments.
iii. Photographs of materials for creating the instruments, and
iv. Photographs of their components.

1.3 Structured interviews were conducted with informants, with defined topics and categories, covering the current state, production knowledge, production methods, production processes, material selection, and wisdom used in the production process.

1.4 Unstructured interviews were employed for in-depth interviews to obtain comprehensive data on the application of wisdom in the production process.

2. Quantitative research was employed to delve into the application of the wisdom of creating Wot to design the contemporary Wot musical instrument as following details:

2.1 Document review entailed examining existing documents and records on relevant topics through an extensive search for the documents from government agencies, educational institutions, textbooks, theses, the internet, the general public, and various personnel. The sources included the Library and Learning Resource Center and the Research Institute of Northeastern Arts and Culture, Khon Kaen University. This was achieved to ensure alignment with the target consumers before developing a sketch design of the contemporary Wot musical instrument.

2.2 The sketch design of the contemporary Wot musical instrument was developed and submitted to design experts to ensure its coherence with the design concept and the target consumers. Subsequently, the design was improved based on feedback and recommendations, and its prototype was created.

2.3 The questionnaire was used to gather the data from instrument makers and design experts. Specifically, it was intended to elicit their opinions on the design of the contemporary musical instrument through a 5-rating scale, with the following interpretations for mean scores.

A mean agreement scores of 4.50-5.00 is classified as Strongest.

A mean agreement scores of 3.50-4.49 is classified as Strong.

A mean agreement scores of 2.50-3.49 is classified as Moderate.

A mean disagreement scores of 1.50-2.49 is classified as Strong.

A mean disagreement scores of 1.00-1.49 is classified as Strongest.

RESULTS

1. Investigation of the wisdom of making Wot, including the wisdom of production and the wisdom of material selection, in Rob Muang Sub-district, Nong Phok District, Roi Et Province.

1.1 The results showed five steps of production as described below.

i. The production process included cutting Maai Pai Hia bamboo, tuning the sound of reeds or pipes, making the core, attaching the pipes to the core, and making the headpiece. The analysis of the wisdom of Wot-making about the production process is given below.
ii. Cutting Maai Pai Hia bamboo should entail selecting the first node 1-1.5 centimeters in size, progressively smaller to match the pitch levels of the pipes. A sharp bamboo splitter should be used in place of a dull one to prevent the bamboo from breaking. The bamboo must be cut at a 45-degree angle, and rough edges must be smoothed with sandpaper for ease of use.
iii. In tuning the sounds of the pipes, Wot makers need to create a local tuner based on blowing the pipes and using the tuner to determine the standard sounds. In this stage, using the tuner will accelerate the tuning process, using beeswax to plug the holes in the pipes to adjust the sound levels to match the tuner.
iv. In making the core, the middle section of a bamboo stalk should be selected to ensure strength, with a diameter of approximately 4 centimeters. Once the core is cut to the desired size, it must be smoothed with a grinder. Subsequently, the longest pipe is measured to cut the core to the appropriate length, so that the pipe fits perfectly.
v. To attach the pipes to the core, the process starts with applying latex glue along the entire core and using beeswax or resin to seal around the headpiece or top. Once this is finished, another layer of the glue is applied. Afterward, the pipes must be attached to the core, starting with the largest and continuing to the smallest. Finally, the tops of all the pipes are level with each other.
vi. In making the headpiece or top, it was found that applying water to beeswax softens it, facilitating shaping during the ornamentation process. Additionally, plastic is applied over the beeswax after ornamentation, ensuring ease of use for the performers.

1.2 Results of material selection

i. Materials cover Maai Pai Ruak bamboo used to make the core, beeswax or resin, and Maai Pai Hia bamboo used to make the pipe and plastic.
ii. The equipment includes a bamboo splitter, a Wot local tuner, sandpaper, a handsaw, a tuner, a grinder, latex glue, and rubber bands.
iii. Selection of wood for making Wot:
    a. Select aged, mature, or ripe wood, which can be determined by its long stalks with long internodes and a green color mixed with brown.
    b. Choose the thinnest stalk, identifiable by its thin edge and red color. This selection lies in the fact that the thin wood allows more light to pass through the stalk.
    c. The cavity of the wood should be neat, clean, and free of roughness, without any mold, and extremely smooth.
    d. The bamboo stalk should be straight and not bent.
    e. Finally, the bamboo should be sun-dried until the wood color changes from green to dark brown.

2. Application of the wisdom of making Wot in Rob Muang Sub-district, Nong Phok District, Roi Et Province, to design the contemporary Wot musical instrument. The findings are presented based on opinions obtained from questionnaires completed by students passionate about Isan musical

instruments, experts in the instruments, and experts in musical instrument design. The wisdom of Isan musical instruments was analyzed, and the findings are presented in tables and divided into three parts as follows:

Part 1: Results of the analysis of expert evaluations through content analysis and percentage data regarding experts' opinions on the application of Isan musical instrument wisdom to the design of the contemporary musical instrument. Results of the analysis of questionnaires regarding the application of Isan musical instrument wisdom for the development of Isan musical instruments.
Part 2: Results of the analysis of the design process of the contemporary musical instrument through the application of Isan musical instrument wisdom. The researchers collected data on the integration of production and material selection wisdom to identify appropriate models and develop sketch designs for the prototype of the contemporary musical instrument. The satisfaction with the prototype was assessed across aspects, namely production suitability, aesthetic appeal, ease of performance, and material appropriateness.
Part 3: Results of the analysis of satisfaction among customers and users towards the contemporary musical instrument developed with the wisdom of Isan musical instruments across four aspects, including production suitability, aesthetic appeal, ease of performance, and material appropriateness.

Part 1: Results of the analysis of expert evaluations.

Table 1: Analysis of integrating the wisdom of making Wot into the design of the contemporary musical instrument

Types of Wot-making Wisdom	 **Carving**		 **Cutting**		 **Tuning**	
Levels of Opinions	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1. This wisdom portrays the identity of Isan musical instruments.	4.70	0.17	4.01	0.32	4.75	0.41
2. The wisdom techniques, and production practices suit the practical application.	4.13	0.31	4.12	0.35	4.31	0.33
3. This wisdom is suitable for application to the design of the contemporary musical instrument.	4.17	0.44	4.21	0.43	4.28	0.34
4. Structural suitability	4.24	0.35	4.25	0.21	4.37	0.42
Total	4.57	0.41	4.23	0.31	4.41	0.53

Based on Table 1, regarding the incorporation of the wisdom of making Wot into designing the contemporary musical instrument, carving was rated highest ($\bar{x}$ = 4.57) by all three experts for its appropriateness, followed by tuning ($\bar{x}$= 4.41) and cutting ($\bar{x}$= 4.23).

Table 2: Analysis of integrating the wisdom of making Wot into the design of the contemporary musical instrument

Types of Wot-making Wisdom	 **Wood Finishing**		 **Whittling**		 **Woodworking Joinery**	
Levels of Opinions	$\bar{x}$	S.D.	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1. This wisdom portrays the identity of Isan musical instruments.	3.41	0.17	3.45	0.21	3.51	0.51
2. The wisdom, techniques, and production practices suit the practical application.	3.33	0.32	3.63	0.41	3.57	0.45
3. This wisdom is suitable for application to the design of the contemporary musical instrument.	3.27	0.42	3.77	0.45	3.42	0.37
4. Structural suitability	3.48	0.31	3.44	0.43	3.61	0.42
Total	3.44	0.32	3.69	0.32	3.43	0.31

As depicted in Table 2, about the application of wisdom to the design of the contemporary musical instrument, whittling was rated high ($\bar{x}$ = 3.69) by all three experts for its appropriateness, followed by wood finishing ($\bar{x}$= 3.44) and woodworking joinery ($\bar{x}$= 3.43).

Part 2: Results of the analysis of the design process of the contemporary musical instrument through the application of Isan musical instrument wisdom

Table 3: Results of the analysis on the means and standard deviations from the questionnaire regarding the application of Isan musical instrument wisdom for designing the contemporary musical instrument based on the study of production processes and material selection.

Design Concepts under Evaluation	 **Design 1**	 **Design 2**

1. Suitability of the design	$\bar{x}$	S.D.	$\bar{x}$	S.D.
1.1. The design exhibits the identity of Isan musical instruments.	4.21	0.16	4.44	0.19
1.2. The materials are suitable for production.	4.22	0.22	4.47	0.17
1.3. It is suitable for integration into the design of contemporary musical instruments.	4.31	0.13	4.51	0.21
2. Aesthetic appeal	$\bar{x}$	S.D.	$\bar{x}$	S.D.
2.1. The musical instrumen exhibits aesthetic appeal ir terms of design and shape.	4.27	0.21	4.59	0.13
2.2. Its design is appealing and interesting.	4.31	0.17	4.53	0.21
2.3. The materials utilized in production are appropriately selected.	4.25	0.24	4.49	0.15
3. Preservation of the identity of Isan musical instruments	$\bar{x}$	S.D.	$\bar{x}$	S.D.
3.1. Its unique design preserves the essence of Isan musical instruments.	4.33	0.21		0.13
3.2. Its shape and structure portray the identity of Isan musical instruments.	4.31	0.27		0.15
3.3. The selected materials are suitable for applicat	4.25	0.23		0.20
4. Suitability for performing		S.D.	$\bar{x}$	S.D.
4.1. The design and shape are suitable for performance.	4.11	0.29	4.19	0.14
4.2. The chosen materials are durable and suitable for performance.	4.21	0.14	4.32	0.11
4.3. This contemporary musical instrument is functional for performance.	4.25	0.17	4.27	0.13
Total	4.35	0.21	4.57	0.19

Figure 10: Selection of wisdom for making wot

Table 3 illustrates the experts' opinions on the integration of wisdom, encompassing the wisdom of production and material selection, into the design of the contemporary Wot musical instrument. Overall, Design 2 achieved the highest level of appropriateness, with **"**The design exhibits the identity of Isan musical instruments" rated with a mean score of 4.44, "The materials are suitable for production" with 4.47, and "It is suitable for integration into the design of contemporary musical instruments" with that of 4.51. Additionally, "The musical instrument exhibits aesthetic appeal in terms of the design and shape" achieved a mean score of 4.59, with "Its design is appealing and interesting" rated with a mean score of 4.53 and "The materials utilized in production are appropriately selected" with that of 4.49. What's more, "Its unique design preserves the essence of Isan musical instruments" attained a mean score of 4.55, with "Its shape and structure portray the identity of Isan musical instruments" with 4.53 and "The selected materials are suitable for application" with that of 4.57. More importantly, "The design and shape are suitable for performance" was rated with a mean score of 4.19, with "The chosen materials are durable and suitable for performance" of 4.32, and "This contemporary musical instrument is functional for performance" with that of 4.27. Hence, the contemporary musical instrument was designed as detailed below.

1) The wisdom of cutting was applied to design the contemporary Wot musical instrument. In particular, it was cut, angled at 45 degrees, and sanded to a smooth finish for ease of performance. Additionally, steel materials with high durability were used in place of bamboo, and the design incorporated contemporary elements.
2) The wisdom of bending was also used. Specifically, bamboo bending techniques were incorporated, contributing to a smooth and contemporary design.
3) The wisdom of wood turning was applied. In particular, woodturning techniques in the production of Ponglang were utilized to create Wot's core to modernize the design.
4) In terms of material selection, steel pipes of a similar size to traditional bamboo were used in the design of the contemporary Wot musical instrument. Additionally, epoxy was used in place of beeswax, providing greater strength and a more contemporary appearance.

Part 3: Results of the analysis of satisfaction among customers and users towards the contemporary musical instrument developed with the wisdom of Isan musical instruments across four aspects, including production suitability, aesthetic appeal, ease of performance, and material appropriateness.

Table 4: **Results of the analysis on the means and standard deviations from the questionnaire on satisfaction with the application of Isan musical instrument wisdom in the design of the contemporary musical instrument.**

Items	**N = 300**	**Levels of Agreement**

	$\bar{x}$	S.D.	
1. Suitability of the design	4.51	0.18	Highest
2. Aesthetic appeal	4.55	0.19	Highest
3. Preservation of the identity of Isan musical instruments	4.35	0.19	High
4. Suitability for performance	4.35	0.17	High
Total	**4.48**	**0.15**	Highest

Based on Table 4, the design of the contemporary Wot musical instrument, incorporating the wisdom of Isan musical instruments, achieved the highest satisfaction, with a mean score of 4.48 and an S.D. of 0.15. It can be implied that enthusiasts of Isan musical instruments can build on this design to create potential business opportunities. This lies in the fact that this instrument is increasingly modern, with enhancements such as stronger materials and distinctive sounds through new materials that diverge from traditional materials. Additionally, it suits various performance settings and is priced appropriately based on the design and quality typical of Wot instruments.

DISCUSSION

1. Discussion of the study on the wisdom of Wot-making, including the wisdom of production and wisdom of material selection, in Rob Muang Sub-district, Nong Phok District, Roi Et Province. Isan musical instrument makers inherit the wisdom of Isan musical instruments from their ancestors through oral traditions. They rely on their memory and hands-on experience to achieve expertise. This starts with creating the tools used for making Isan musical instruments, seeking methods to streamline the production process, and constantly adapting the tools used in the creation of Isan musical instruments. Additionally, the Isan instrument makers constantly search for new materials. For instance, the wood used to create the instruments must be aged at least 20 years. They test the sounds of different types of food to produce new sounds. Moreover, they continuously integrate Western instruments into Isan instruments to fulfill international standards. Based on the analysis of the wisdom of Isan musical instruments including the wisdom of production and material selection, each instrument maker has their process for making Isan musical instruments, with their wisdom acquired through practice and trial and error. This is akin to Khamaphan (2012), method of making Wot. Her study found that a person developed Wot from a toy into a wind instrument in the Isan region. His method was derived from self-directed trial and error, evolving into a widely adopted technique throughout the region. The primary materials can be sourced locally, such as Gu Khaen wood, bamboo, and beeswax. Similarly, the tools are locally available, such as bamboo splitters, machetes, and saws. The process of Wot-making commences with creating the pipes, followed by creating the core and assembling the two components. Subsequently, one end of the pipes is sealed with beeswax. Finally, the headpiece or top is created and fashioned using beeswax, ensuring that its appearance and tonal characteristics align with the sound system of Isan folk music, enabling it to be played in harmony with other instruments.

2. Discussion of the application of the Wot-making wisdom in Rob Muang Sub-district, Nong Phok District, Roi Et Province, for the design of the contemporary Wot musical instrument. The design of the contemporary musical instrument drew upon a body of knowledge gained from the study of the wisdom of Isan musical instruments. In particular, two aspects of wisdom were investigated in this study, namely the wisdom of production and the wisdom of material selection. Various aspects of the wisdom of production applied in this study included carving, cutting, tuning, wood finishing, whittling, and woodworking joinery. Additionally, material selection methods were adopted to design the contemporary musical instrument, increasing its durability. In particular, aluminum was employed to enhance its strength and durability while introducing new options for enthusiasts of Isan musical instruments. This is in line with Suksod's concept (2001), stating that design can be

divided into two parts: new creation and improvement or development upon existing designs. The product design entails drawing partial inspiration from traditional designs and adapting them to align with the roles and values of modern society. This approach, referred to as contemporary design (contemporary style), involves integrating elements of both traditional and modern designs to create a product that is relevant in the present context. This is regarded as a form of modern or contemporary design. The elements of the traditional design which can be incorporated into new designs may include materials, production methods, or designs. This also resonates with Choibamroong (2011), stating that the concept of a creative economy refers to the production of goods and services by drawing upon cultural resources, such as history, traditions, ways of life, and everyday practices. This is combined with knowledge, creativity, and suitable technology to differentiate products and services, fulfilling consumers' needs. These products and services are typically characterized by uniqueness and high value.

LIMITATIONS OF THE STUDY

1. This study was focused on Isan musical instruments only, specifically the Wot. Therefore, it may not fully represent the variety of musical traditions in other regions of Thailand or Southeast Asia.

2. This research is about historical study, therefore it has relied mostly on qualitative methods, such as reviewing a lot of literature, interviews, and observations, which may introduce subjective bias in the data interpretation and may not cover overall patterns.

In addition, the adaptation of local wisdom to be adapted to musical instrument design was limited by available materials and market demands, which may not preserve overall the authenticity or traditional essence of the original Isan instruments.

CONCLUSION

1. Conclusion of the study on Wot-making wisdom, including the wisdom of production and wisdom of material selection, in Rob Muang Sub-district, Nong Phok District, Roi Et Province. A prominent aspect of the production wisdom lies in the use of locally available materials for making Wot, such as the cultivation of bamboo species as in Maai Pai Ruak and Maai Pai Hia and the use of beeswax or resin, thereby reducing production costs significantly. Additionally, the production process has been streamlined to reduce the production steps. To illustrate, the use of the local tuner developed by Mr. Bancha Chobboon based on his expertise and wisdom streamlines the tuning process, ensuring accurate key alignments. The key aspect of the material selection wisdom involves selecting aged, mature, or ripe wood, which can be identified by its long stalks with long internodes and a green color mixed with brown. It also entails choosing the thinnest stalk, identifiable by its thin edge and red colors, since it allows greater light to pass. They are extended to the selection of wood with a cavity that is neat, clean, and free of roughness, without any mold, and extremely smooth. The bamboo stalk should be straight, not bent, and must be sun-dried until the wood color changes from green to dark brown. The significance of the wisdom of material selection for making Wot cannot be overstated since it can contribute to the optimal quality of its sound. This is a secret technique practiced by Mr. Bancha Chobboon. Furthermore, it encompasses the wisdom of beliefs. Formerly, Wot was a children's toy in the Isan region, and playing Wot was called "Ngew Wot". The elderly would advise against playing it during the rainy season, believing that it would prevent rainfall and hinder farming. As it evolved into a musical instrument, the belief faded. Nevertheless, a symbolic connection to water remains, imbuing Wot with a deeper significance, representing the flow of music.

2. Conclusion of the application of the wisdom of making Wot in Rob Muang Sub-district, Nong Phok District, Roi Et Province, to design the contemporary Wot musical instrument. In designing the contemporary musical instrument by drawing upon the wisdom of Isan musical instruments, covering the wisdom of production and wisdom of material selection, the researchers designed it to embody the identity of Isan musical instruments. In particular, the design captured its inherent wisdom, and this wisdom can be preserved through further development to incorporate new materials, catering to the needs of both performers and enthusiasts of Isan musical instruments, as well as market demands. The shape of the developed contemporary musical instrument embodies the wisdom of Isan musical instruments, the incorporation of metallic materials to enhance its durability, and newly designed structural elements.

RECOMMENDATIONS

1. The wisdom of Isan musical instruments, including the wisdom of production and material selection, should be further developed and expanded. This can be applied to the creation of other musical instruments or adapted for use in other types of craftsmanship.

2. Isan musical instruments should be constantly redesigned with new styles, and new materials should be incorporated into the creation of Isan musical instruments. This would ensure their continuous development.

3. New materials should be experimented with in the creation of Isan musical instruments. Additionally, further studies should incorporate various symbols into the instruments, creating new and distinctive designs.

4. The wisdom from other cultures should be combined with that of the creation of Isan musical instruments. For example, the wisdom of creating Northern Thai instruments, such as Phin Pia, Seung, and Pee Jum, should be incorporated with that of Isan musical instruments to create new instruments or innovative designs over time.

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