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Design and Development of a Prototype Banana Fiber Rope Bag by the Kayubokor Weaving Group, Kayubokor Subdistrict, Raman District, Yala Province

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Abstract

The research entitled "Design and Development of a Prototype Banana Fiber Rope Bag by the Kayubokor Weaving Community Enterprise, Kayubokor Subdistrict, Raman District, Yala Province" aims to 1) study the problems and weaknesses of the original banana rope bags, 2) design and develop a prototype product, and 3) evaluate consumer satisfaction. This research is a Research and Development (R&D) study utilizing both qualitative and quantitative data. A total of 517 samples consisted of 100 consumers who had previously purchased or intended to purchase banana rope bags, 16 community enterprise members, and 401 general consumers. The research instruments included questionnaires, interview forms, and satisfaction evaluation forms, which were checked for content validity (IOC) and reliability (Cronbach's alpha). Data were analyzed using percentage, mean, and standard deviation. The research findings revealed that the original bag designs were outdated, lacked variety, failed to reflect local identity, and had limitations regarding durability and usability. Therefore, a prototype was developed by modernizing the design, strengthening the structure, improving functional usage, and integrating local identity into the product. Two prototype designs were produced based on the "curved tree" concept, which comes from the meaning of the community name, Kayubokor. The overall consumer satisfaction evaluation for the prototype was at a highest level ($\bar{x}$ = 4.53, S.D. = 0.63) across all aspects, including design, aesthetics, usability, and product quality. These results show that the prototype was accepted by the respondents and has potential to be further developed for commercial production.

Keywords: Product development, Banana fiber rope bag, Community enterprise, Local identity

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Introduction

Currently, Thailand's economic development policy continuously emphasizes strengthening the grassroots economy. The focus is on enabling people at the community level to be self-reliant in terms of both income and quality of life, by supporting the efficient and sustainable use of local resources. This approach encourages community enterprises to play a crucial role in driving the local economy, particularly by applying local wisdom alongside modern knowledge to develop unique products that generate added value (Community Development Department, 2022). However, despite continuous promotion, it has been found that many community products still face issues regarding quality, design, and systematic development. Specifically, the lack of design knowledge that aligns with market demand has resulted in products that cannot compete effectively (Office of Small and Medium Enterprises Promotion, 2021).

Meanwhile, consumer behavior in the modern era has shifted. Consumers no longer consider only functional utilities but also prioritize aesthetics, uniqueness, emotional value, and eco-friendly concepts, which increasingly influence their purchasing decisions (Kotler & Keller, 2016). This makes products using natural materials, such as "banana fiber rope," highly potential for development into contemporary handicrafts that meet market demands and create appropriate added value (Department of Industrial Promotion, 2020).

The Kayubokor Weaving group in Kayubokor Subdistrict, Raman District, Yala Province, is a group that utilizes local wisdom to produce bags from banana rope to generate income. However, studies show that their products still have limitations, such as simplistic designs, a lack of modernity and variety, and failure to meet the usage needs of modern consumers. Additionally, they lack distinctiveness compared to similar products, resulting in sales being limited to the local level and an inability to fully expand into commercial markets. Furthermore, there is a lack of integration of the community's identity into the design, despite the name "Kayubokor" meaning "curved tree," which could be used as a concept to create product uniqueness.

However, previous studies on banana rope products in Thailand have mainly focused on developing packaging from local materials (Pottham Narongwit & Nattikan Pinju, 2017), coating banana rope to increase its strength (Sopida Wisansakkul & Orawan Upathampanon, 2021), and developing banana rope products toward community product standards (Kritsanawan Sawiphong et al., 2022). At the international level, banana fiber is recognized as a natural material with potential for sustainable products (Balda et al., 2021), and collaboration between designers and artisans has been found to create added value for craft communities (Hu et al., 2024; Wang et al., 2023). Nevertheless, there are still few studies that use the identity of a community, such as the

meaning of the community's name, as a concept for designing banana rope bags through a systematic research and development (R&D) process, starting from studying the problems of the product, developing a prototype together with the weavers, and evaluating consumer satisfaction. Such studies are especially limited in the southern border provinces of Thailand, including the Kayubokor Weaving group. This is the research gap that the present study aims to fill.

Therefore, the researchers formulated a concept to design and develop a prototype banana rope bag for the Kayubokor Weaving group. This was done using a systematic Design Process, starting from studying the community context, analyzing materials, and surveying consumer needs to develop a product design suitable for both usability and aesthetics. The "curved tree" concept was also applied in the design to reflect the community's identity. Furthermore, experts were given the opportunity to participate and provide feedback. The research outcomes are expected to help elevate the product to be modern, unique, and sustainably add value to local resources.

Objectives

1. To study the problems and weaknesses of the original banana rope bag products of the Kayubokor Weaving group.

2. To design and develop a prototype banana rope bag product for the Kayubokor Weaving group.

3. To evaluate consumer satisfaction toward the prototype banana rope bag product of the Kayubokor Weaving group.

Research Questions

1. What are the problems and weaknesses of the original banana rope bags of the Kayubokor Weaving group from the perspectives of producers and consumers?

2. How can a prototype banana rope bag be designed and developed to address these problems while reflecting the identity of the Kayubokor community?

3. To what extent are consumers satisfied with the prototype in terms of quality and strength, design and aesthetics, utility, and value for money?

Literature Review

Community Context and History of the Community Enterprise

The Kayubokor Weaving group has demonstrated strong development by integrating natural capital with local collaboration networks. It originated from adding value to banana residue, a local resource, by processing it into the area's first woven products (Yala Rajabhat University, 2023). The establishment process emphasized participation among higher education institutions, local government organizations, and community leaders to solve poverty and elevate the local people's quality of life (Kayubokor Subdistrict Administrative Organization, 2023). Subsequently, it was registered as a community enterprise in 2024. The group has developed its management systems, group savings, and expanded marketing channels through various networks to achieve OTOP product standards (Kayubokor Weaving Group, 2024).

Concepts and Theories on Community Enterprises

Community enterprise refers to community capital management operated creatively for self-reliance and mutual support among community members. It utilizes local resources, wisdom, and culture to produce goods or services (Community Enterprise Promotion Act B.E. 2548). This concept is fundamentally based on grassroots economic development, emphasizing "community capital" management to create economic added value while sustainably improving community members' quality of life (Seri Phongphit, 2005). Similarly, the Department of Agricultural Extension (2019) noted that community enterprises act as a key mechanism promoting citizen grouping to manage their resources. This increases the value of yields, particularly by processing local raw materials like banana fibers into handicraft products, which helps develop occupational skills and instills pride in local identity.

In addition, Buratti et al. (2022) reviewed international studies on community enterprises and explained that community enterprises engage in commercial activities to create economic, social, and environmental benefits for their communities, but they often face limitations in resources and capabilities. Therefore, product development is one of the important issues for community enterprises that use local resources.

Concepts and Theories on Local Wisdom and Identity

Local Wisdom refers to the knowledge, skills, and beliefs of local groups accumulated and passed down to solve problems and sustain livelihoods. In this context, it refers to the weaving skills and the processing of banana tree materials by the Kayubokor community.

Identity refers to distinct, unique characteristics that clearly reflect the cultural roots of weaving, banana processing wisdom, and the history of the Kayubokor community in Raman District, Yala Province. These traits are distinct enough to differentiate them from woven crafts

made from other materials (Royal Institute, 2011). Identity consists of tangible attributes, such as local weaving patterns and the texture of banana ropes, as well as intangible attributes like the agricultural lifestyle, craftsmen's meticulousness, and beliefs tied to local resources (Chai Phothisita, 2019). In product development, identity acts as a vital mechanism for creating Value Added through Storytelling, which uniquely presents the local persona. This creates a clear memorable image for consumers and a sustainable competitive advantage (Nonglak Wiratchai, 2018).

Recent studies also found that cultural identity in handicraft products has a positive influence on consumers' purchase intention, especially for handmade products (Zhang et al., 2023). Similarly, Li et al. (2023) found that consumers' identification with cultural products and their perceived authenticity affect their purchase intention. These findings support the use of community identity as a concept for developing local products.

Concepts and Theories on Product Design and Development

Product Development refers to the systematic process of creating, improving, or developing products to ensure they possess quality, design, and features that efficiently meet consumer needs and market changes (Ulrich & Eppinger, 2016). It covers everything from studying consumer needs and designing, to creating prototypes, and refining them for practical use. Similarly, Siriwan Serirat et al. (2017) explained that product development is a Differentiation strategy aimed at giving goods a new characteristic or better quality. This makes the product stand out and become competitive in the current market.

For traditional crafts, Hu et al. (2024) explained that collaboration between designers and artisans helps adapt craft products to market needs while maintaining their cultural value, although there may be barriers in exchanging knowledge. Wang et al. (2023) also found that co-design can empower rural craftspeople when they participate in each stage of the design process. In terms of research method, research and development (R&D) is a cycle of studying needs, developing a product, testing it with users, and improving it (Gall et al., 2007). This study applied this process to develop the prototype banana rope bag.

Concepts and Theories on Quality Assessment and Satisfaction

Product quality assessment refers to the process of considering, analyzing, and inspecting product characteristics in various aspects to determine the quality level, strengths, weaknesses, and limitations of the product (Garvin, 1987). Assessment provides data that manufacturers or product developers can use as guidelines to improve and develop better quality products. It also helps to appropriately meet consumer needs. Additionally, product quality assessment is a crucial tool that elevates product standards and increases market competitiveness (Supawadee Srithong et al., 2019). The concept of product quality assessment can be considered from several key

elements related to material characteristics, usage, and product value, as proposed by Garvin (1987).

Garvin (1987) proposed eight dimensions of product quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. In this study, these dimensions were adapted into four aspects suitable for handmade bags: quality and strength, design and aesthetics, utility, and value for money.

Concepts and Theories on Consumer Satisfaction

Consumer Satisfaction refers to the emotional level a person experiences after comparing the outcomes of using a product or service against their prior expectations (Kotler & Keller, 2016). Satisfaction is considered a critical factor reflecting product quality because it directly impacts repeat purchase decisions, product loyalty, and positive word-of-mouth recommendations (Siriwan Serirat et al., 2017; Adul Jaturongkakul, 2014).

In addition, Oliver (1980) explained that satisfaction occurs when the product performance that consumers perceive meets or exceeds their expectations. Therefore, satisfaction measured after consumers examine a prototype reflects their initial evaluation of the product, not its long-term performance.

Related Research

Pottham Narongwit and Nattikan Pinju (2017) studied the design and development of rice packaging using local materials, specifically paper and banana rope. Employing a participatory design process with the community, the research found that combining banana rope with banana paper helped establish a local identity and reduced production costs. The third packaging design was deemed the most suitable, and consumers demonstrated a high level of satisfaction with the packaging.

Sopida Wisansakkul and Orawan Upathampanon (2021) studied coating banana rope with microcrystalline wax to enhance product quality. They found that the optimal micro-wax amount was 25 percent, which provided a smooth surface, low moisture, and increased strength for the banana rope. Furthermore, consumer acceptance regarding design, usability, and overall satisfaction was at a high level.

At the international level, Balda et al. (2021) reported that banana fiber from the pseudo-stem is a natural, biodegradable, and renewable material that can be used in textiles and other eco-friendly products. This supports the development of banana rope bags as sustainable community products.

Kritsanawan Sawiphong, Supapich Damnual, and Sutee Thepsuriwong (2022) studied the development of banana rope products toward community product standards in Ban Khao Subdistrict, Ranot District, Songkhla Province. Using a mixed-methods research process and practical workshops, they successfully developed 5 types of banana rope products: hats, square bags, round bags, lidded containers, and crossbody bags. Participants in the training showed a high level of satisfaction, and the products met community product standards at a good level.

Summary of the Literature Review and Conceptual Framework

From the literature review, the concepts and theories can be linked to form the conceptual framework of this study as follows. The concept of community enterprise explains the need for the Kayubokor Weaving group to create added value from local resources (Seri Phongphit, 2005; Buratti et al., 2022). The concept of product quality assessment (Garvin, 1987) was used to determine four aspects, namely quality and strength, design and aesthetics, utility, and value for money, for studying the problems of the original product (Input, Research Question 1). The concepts of product design and development (Ulrich & Eppinger, 2016; Gall et al., 2007) and local wisdom and identity (Nonglak Wiratchai, 2018; Zhang et al., 2023) were used as guidelines for designing and developing the prototype together with the community (Process, Research Question 2). Finally, the concept of consumer satisfaction (Kotler & Keller, 2016; Oliver, 1980) was used to evaluate the prototype in the same four aspects (Output, Research Question 3). Since this study is a research and development study, not a study of cause and effect between variables, the conceptual framework is presented as an input-process-output model instead of independent and dependent variables, as shown in Figure 1.

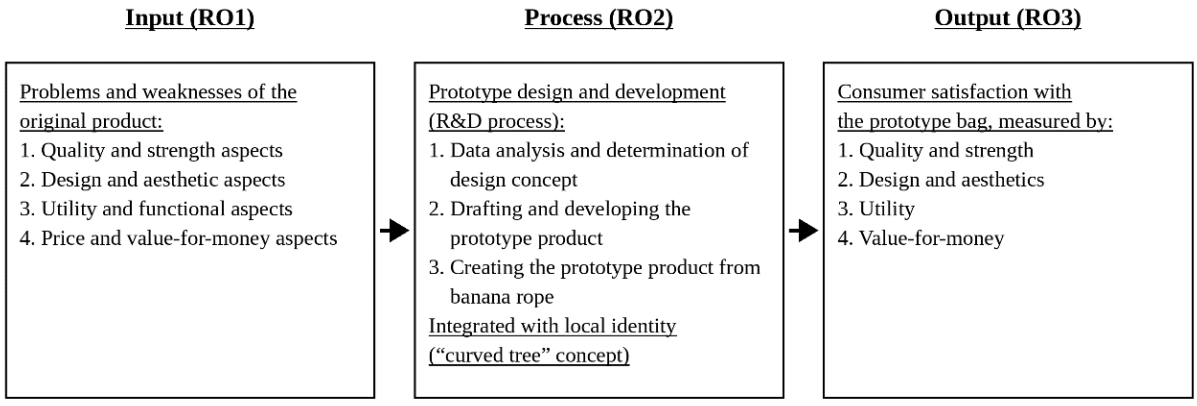


Figure 1 Conceptual framework (input-process-output model)

Research Methodology

Research Design

This research was conducted as research and development (R&D) consisting of four phases (Gall et al., 2007). Phase 1 studied the problems and weaknesses of the original banana rope bags and the needs of consumers. Phase analyzed the data, determined the design concept from the "curved tree" identity of the community, drafted the designs together with the group members, and improved them according to the suggestions of 3 experts in product design and community product development. Phase 3 produced the prototypes from banana rope and evaluated consumer satisfaction. Phase 4 summarized the evaluation results and consumer suggestions as guidelines for further improvement of the prototype.

1. Population and Sample

The population used in this research included the chairperson, committee members, and members of the Kayubokor Weaving group in Kayubokor Subdistrict, Raman District, Yala Province, who produce the woven banana rope bags. It also included consumers who have purchased or intend to purchase these products. The producers provided knowledge and experience regarding the production and product development processes, while consumers acted as crucial data sources reflecting opinions and needs. The consumer population was considered an Infinite Population. The sample comprised three groups totaling 517 participants including 16 community enterprise chairpersons, managers, and members selected via purposive sampling, 100 consumers who had previously purchased or intended to purchase the product, also selected via purposive sampling and 401 general consumers. The sample size was determined using Cochran's (1977) formula at a 95% confidence level and a 5% margin of error to ensure comprehensive and statistically reliable data. Since the consumer population was an infinite population, the minimum sample size calculated by Cochran's formula was 385 people. The researchers collected 401 complete questionnaires, which was more than the minimum sample size.

2. Research Instruments

The instruments used in this research consisted of 3 types: 1) Semi-Structured Interview: Used to collect qualitative data from the community enterprise's chairperson and members. These were open-ended questions covering general information, production processes, original product problems, and development guidelines. 2) Questionnaire: Used to collect quantitative data from consumers. It contained both closed and open-ended questions covering general information, problems, and consumer needs. 3) Satisfaction Evaluation Form: Used to evaluate consumer opinions on the prototype product using a 5-level rating scale (Likert Scale). It covered 4 aspects: quality and strength, design and aesthetics, utility, and value for money. All instruments were

designed in alignment with the research objectives to ensure systematic data collection and effective, reliable product development analysis.

Before data collection, all instruments were checked for quality. Content validity was examined by 3 experts in [product design, marketing, and research methodology using the Index of Item-Objective Congruence (IOC) (Rovinelli & Hambleton, 1977). Items with an IOC value of 0.50 or higher were used, and the IOC values were between [0.80] and [1.00]. Then, the questionnaire and the satisfaction evaluation form were tried out with 30 consumers who were not in the sample group. Reliability was tested using Cronbach's alpha coefficient (Cronbach, 1951), and the values were [0.91] for the questionnaire and [0.82] for the satisfaction evaluation form, which were higher than the acceptable level of 0.70.

3. Data Collection

The researchers collected data in three phases according to the research objectives during [December 2025 –March, 2026] as follows.

Phase 1 : The data sources were 16 members of the Kayubokor Weaving group (Group 1) and 100 consumers who had purchased or intended to purchase banana rope bags (Group 2). The researchers interviewed the group members at the group's workplace in Kayubokor Subdistrict using the semi-structured interview form to collect data on the production process, materials, and problems of the original bags. Examples of the questions were “What problems do customers often mention about the current bags?” and “Which parts of the bag are easily damaged when used?” The researchers also observed the production process. For Group 2, the questionnaire was used to collect data on the weaknesses of the original bags and the needs of consumers regarding design, size, color, function, and price, for example, “Which aspects of the current banana rope bag should be improved?”

Phase 2: The researchers analyzed the data from Phase 1 to determine the design concept. The researchers and the group members drafted the bag designs together in workshops. Then, the experts reviewed the drafts, and their suggestions were used to select and improve the designs before the group members produced the prototypes from banana rope.

Phase 3 : The researchers presented the prototypes to 401 general consumers (Group 3), who examined the products and completed the satisfaction evaluation form via an online form with photographs of the prototypes. The form contained 20 items in four aspects: quality and strength, design and aesthetics, utility, and value for money.

4. Data Analysis

The researchers analyzed the collected data using methods consistent with both qualitative and quantitative data types. Qualitative data obtained from semi-structured interviews, open-

ended questions, and observations were analyzed using Content Analysis. This involved organizing data, categorizing key points, and grouping them according to the research conceptual framework to summarize essential information regarding community identity, production techniques, product limitations, and consumer needs. For quantitative data obtained from the questionnaires, Descriptive Statistics were used, including Percentage, Mean, and Standard Deviation (S.D.). These statistics were utilized to analyze the general demographic data of the sample and the level of consumer satisfaction toward the prototype product across four aspects: quality and strength, design and aesthetics, utility, and value for money, allowing for a systematic and clear explanation of the research findings. The mean scores were interpreted according to the following criteria (Best, 1977): 4.51–5.00 = highest, 3.51–4.50 = high, 2.51–3.50 = moderate, 1.51–2.50 = low, and 1.00–1.50 = lowest.

Results

The research results are presented according to the research objectives as follows.

1. Problems and Weaknesses of the Original Banana Rope Bags

From the content analysis of the interviews with 16 group members and the questionnaires from 100 consumers, it was found that the original banana rope bags had weaknesses in all four aspects. In terms of quality and strength, the bags were not durable enough for everyday use [e.g., the banana rope absorbed moisture and frayed easily]. In terms of design and aesthetics, the designs were simple and outdated, lacked variety, and did not reflect the identity of the Kayubokor community. In terms of utility, the bags did not meet the usage needs of modern consumers [e.g., lack of internal compartments and suitable straps]. In terms of price and value for money, the products were not distinctive compared with similar products, which reduced their market value, and sales were limited to the local level.

2. Design and Development of the Prototype

The researchers determined the design concept as “Kayubokor, the curved tree,” based on the meaning of the community's name, in order to present the local identity and the story of the community through the product. The design and development process consisted of three steps. First, the data were analyzed and the design concept was determined. The problems and needs of consumers were summarized into design requirements, namely a modern appearance, more variety, a stronger structure, better functions, and a clear local identity. Second, the prototype was drafted and developed. The researchers and the group members drafted the designs together, and the designs were improved according to the experts' suggestions. Third, the prototype was created. Two prototype designs were produced, as shown in Figure 2. Design 1 is a tote bag with two handles, and Design 2 is a shoulder bag with an adjustable strap. Both designs have a lower part woven from banana rope and an upper part decorated with a curved tree pattern. In this way,

the banana rope weaving, which is the local wisdom of the group, is maintained, while the bag looks more modern.



Figure 2 Prototype banana fiber rope bag designs

3. Consumer Satisfaction with the Prototype

The sample of 401 respondents predominantly consisted of females, numbering 322 (80.30%), and males, numbering 79 (19.70%). The majority were aged 20-30 years with 168 people (41.90%), followed by the under-20 age group with 124 people (30.92%). Most of them were students (school/university), numbering 257 (64.09%). Regarding product usage, 263 respondents (65.59%) had never used woven bags, while 138 respondents (34.41%) had previously used woven bags. In addition, most of them had an income of less than 5,000 Baht (272 people, 67.83%) and lived in Yala Province (149 people, 37.16%), followed by Narathiwat Province (124 people, 30.92%) and Pattani Province (115 people, 28.68%).

The results of the satisfaction analysis of the sample group (n=401) regarding the design and development of the prototype banana rope bag showed an overall highest level of satisfaction ($\bar{x}$ = 4.53, S.D. = 0.63). The specific details broken down by aspect are as follows:

Table 1: Evaluation results of respondents' satisfaction by aspect (n = 401)

Evaluation Aspect	$\bar{x}$	S.D.	Level
1. Quality and Strength Aspect	4.46	0.63	High Satisfaction
1.1 The bag is strong and durable for use	4.32	0.64	High Satisfaction
1.2 The banana rope material used is of high quality	4.33	0.64	High Satisfaction
1.3 Appropriate durability	4.55	0.61	Highest Satisfaction
1.4 The weaving or sewing is meticulous	4.58	0.62	Highest Satisfaction
1.5 The quality of the bag is suitable for its intended use	4.51	0.64	Highest Satisfaction
2. Design and Aesthetics Aspect	4.60	0.62	Highest Satisfaction
2.1 The design of the bag is beautiful and attractive	4.59	0.60	Highest Satisfaction
2.2 The colors and patterns of the bag are appropriate	4.64	0.56	Highest Satisfaction
2.3 The bag design is modern	4.54	0.65	Highest Satisfaction
2.4 The bag's design has a unique identity	4.61	0.64	Highest Satisfaction
2.5 The design effectively reflects local identity and wisdom	4.60	0.63	Highest Satisfaction
3. Utility Aspect	4.52	0.63	Highest Satisfaction
3.1 The bag is a suitable size for use	4.53	0.62	Highest Satisfaction
3.2 The bag is convenient to carry	4.59	0.64	Highest Satisfaction
3.3 The bag can be used on various occasions	4.45	0.64	High Satisfaction
3.4 The internal space allocation is appropriate	4.58	0.62	Highest Satisfaction
3.5 The bag satisfies functional needs effectively	4.56	0.63	Highest Satisfaction
4. Value for Money Aspect	4.57	0.62	Highest Satisfaction
4.1 The price of the bag is appropriate for its quality	4.56	0.63	Highest Satisfaction
4.2 The bag is worth the price compared to the benefits received	4.60	0.60	Highest Satisfaction
4.3 The bag provides good value for a purchasing decision	4.55	0.61	Highest Satisfaction
4.4 The bag is appealing for commercial retail	4.54	0.62	Highest Satisfaction

Evaluation Aspect	$\bar{x}$	S.D.	Level
4.5 Overall, the bag is worth it for practical use	4.59	0.63	Highest Satisfaction

Research Discussion

The analysis of the sample's satisfaction (n=401) towards the design and development of the prototype banana rope woven bag revealed that overall satisfaction was at a highest level ($\bar{x}$ = 4.53, S.D. = 0.63). Details broken down by aspect are as follows:

1. Quality and Strength Aspect

Consumers showed the high level of satisfaction ($\bar{x}$ = 4.46, S.D. = 0.63). The highest-rated item was that the weaving or sewing was meticulous ($\bar{x}$ = 4.58), followed by appropriate durability ($\bar{x}$ = 4.55) and the quality of the bag being suitable for use ($\bar{x}$ = 4.51). However, the items “the bag is strong and durable for use” ($\bar{x}$ = 4.32) and “the banana rope material used is of high quality” ($\bar{x}$ = 4.33) had the lowest scores. This shows that the strength of the material should be further improved.

2. Design and Aesthetics Aspect

Consumers demonstrated the highest level of satisfaction ($\bar{x}$ = 4.60, S.D. = 0.62). The item receiving the highest score was that the colors and patterns of the bag were appropriate ($\bar{x}$ = 4.64), followed by the bag having a unique identity ($\bar{x}$ = 4.61), and the design effectively reflecting local identity and wisdom
($\bar{x}$ = 4.60), respectively. This shows that the respondents were satisfied with the beauty of the design and felt that the bag reflected the local identity.

3. Utility Aspect

Consumers showed the highest level of satisfaction ($\bar{x}$ = 4.52, S.D. = 0.63). The item scoring the highest was that the bag is convenient to carry ($\bar{x}$ = 4.59), followed by appropriate internal space allocation
($\bar{x}$ = 4.58), and the bag satisfying functional needs effectively ($\bar{x}$ = 4.56). This shows that the respondents felt the bag was convenient and suitable for everyday use, although long-term use was not tested in this study.

4. Price and Value Aspect

Consumers demonstrated the highest level of satisfaction ($\bar{x}$ = 4.57, S.D. = 0.62). The highest-rated item was that the bag is worth the price ($\bar{x}$ = 4.60), followed by overall worthiness for use ($\bar{x}$ = 4.59), and the price being appropriate for the quality ($\bar{x}$ = 4.56). This shows that the

respondents felt the bag was worth its price, which indicates that the product has potential to create added value. However, actual purchasing behavior was not measured in this study.

Discussion

The research r esults can be discussed according to the research objectives as follows.

1. Problems and weaknesses of the original product

The study found that the original bags had outdated designs, lacked variety, did not reflect local identity, and had limitations in durability and usability. This is consistent with the Office of Small and Medium Enterprises Promotion (2021) and the Community Development Department (2022), which reported that many community products in Thailand still lack design knowledge that meets market demand, so they cannot compete effectively. The problem of durability is also consistent with Sopida Wisansakkul and Orawan Upathampanon (2021), who found that banana rope needs to be coated to reduce moisture and increase its strength, and with Balda et al. (2021), who noted that the properties of banana fiber depend on proper processing. Therefore, the problems of the original product were not only about appearance but were also related to material processing and the limited design knowledge of the group. Hu et al. (2024) also pointed out that limited knowledge exchange is a common barrier for craft communities.

2. Design and development of the prototype

The use of the meaning of the community's name, “curved tree,” in the product design reflects the concept of creating added value through storytelling and local identity (Nonglak Wiratchai, 2018). This is supported by Zhang et al. (2023), who found that cultural identity in handmade products increases consumers' purchase intention, and Li et al. (2023), who found that perceived authenticity is an important factor in purchasing cultural products. The combination of banana rope weaving with other materials to make the product more modern is similar to the study of Pottham Narongwit and Nattikan Pinju (2017), who combined banana rope with banana paper to create local identity, and the study of Kritsanawan Sawiphong et al. (2022), who developed various banana rope products through workshops. In addition, the participation of the group members in designing the bags is consistent with the co-design approach, which Wang et al. (2023) found can empower rural craftspeople when they take part in the design process, and with the product development process that requires continuous improvement (Ulrich & Eppinger, 2016).

3. Consumer satisfaction with the prototype

The overall satisfaction with the prototype was at the highest level, and the design and aesthetics aspect had the highest mean. This is consistent with Kotler and Keller (2016), who stated that consumers today consider not only functional utility but also aesthetics, uniqueness,

and emotional value. It is also consistent with previous studies in Thailand that found a high level of satisfaction with developed banana rope products (Pottham Narongwit & Nattikan Pinju, 2017; Kritsanawan Sawiphong et al., 2022). On the other hand, the quality and strength aspect had the lowest mean, and the items on the strength and quality of the material were only at a high level. According to Oliver (1980), this may mean that the prototype met consumers' expectations about its appearance more than their expectations about its durability, which is one of the dimensions of product quality (Garvin, 1987). However, most respondents were young students, and 65.59% of them had never used a woven bag. Therefore, their satisfaction reflects their first impression of the prototype, not long-term use, and the results should be applied to other consumer groups with caution.

Conclusion

This study found the problems of the original banana rope bags of the Kayubokor Weaving group, developed two prototype designs that combine the “curved tree” identity of the community with banana rope weaving, and evaluated them with 401 consumers. The results show that the respondents were highly satisfied with the prototypes, especially in terms of design and aesthetics, while the strength of the material still needs to be improved. This study shows how a systematic R&D process with community participation can be used to turn local identity into community products in the southern border provinces of Thailand.

Recommendations

Recommendations for Practice

1. The quality of the banana rope material should be developed to increase its strength and moisture resistance. This can be achieved by improving the production process, such as bleaching or coating, to prolong the product's lifespan and preserve its beauty.

2. The bag designs should be developed to offer variety, modernity, and alignment with consumer demands. Concurrently, emphasis should be placed on building community identity and communicating the product's story to increase market value and appeal.

3. The production process should be developed to meet established standards. This involves enhancing the artisans' skills and implementing a quality control system to ensure product consistency and enable sustainable commercial expansion.

4. The Kayubokor Weaving group can use the prototypes to develop a product line under the “curved tree” story, with product labels or tags that explain the meaning of the community's name, the banana rope material, and the handmade process.

5. Local agencies, such as the Kayubokor Subdistrict Administrative Organization and Yala Rajabhat University, should support the group in material treatment, quality control, and market channels, such as OTOP and online channels, to increase actual sales.

Recommendations for Future Research

1. Future research should test the physical properties of the prototypes, such as strength and moisture resistance, in addition to consumer satisfaction.

2. Future research should study willingness to pay, purchase intention, and actual sales with a more diverse sample group and use inferential statistics so that the results can be applied to other contexts.

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