

ISSN 2821-9074 (Online)

ISSN 2730-2601 (Print)

RICE Journal of Creative Entrepreneurship and Management, Vol. 5, No.3, pp. 77-97,
September-December 2024

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doi: 10.14456/rjcm.2024.19

Received 14.10.24/ Revised 5.11.24/ Accepted 26.11.24

The Market Value of Upcycled Home Decorative Furniture Products from Denim: A Case Study of Hiran Ruchi Subdistrict Community in Bangkok**

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Abstract

The problem of managing large waste, such as mattresses and sofas, is one of the major challenges in metropolitan areas, especially in Bangkok, where this type of waste is often disposed improperly and negatively impacts the environment. This research focuses on presenting a large-scale waste management approach through the upcycling process. One of the key materials explored in this research is denim, which is difficult to decompose but can be creatively reused. This research had three objectives: (1) To identify the initial problems regarding surplus materials in the community in Hiran Ruchi Subdistrict, Thon Buri District, Bangkok. (2) To develop a prototype of home decorative furniture products from denim through the upcycling process to create market value for the community. (3) To analyze the relationship between home decorative furniture products made from denim, and the upcycling process that creates market value for the community. The researchers collected data from 500 voluntary participants in the Hiran Ruchi community, using a survey questionnaire and a set of interview questions with IOC values greater than 0.6. The interviews with the participants focused on waste material problems in the community and selection of furniture for product development, and with professional experts on product design, production processes, and marketing. The results indicated the positive relationship between home decorative furniture products made from denim and the upcycling process that creates market value for the community. To the participants under study, the upcycling approach to product development not only addresses the identified waste problem but also taps on new markets for upcycled products with environmental sustainability value. It was also expected that upcycled products could help generate income for the community, aligning with the needs and value of modern consumers for environmental conservation and sustainability in product development.

Keywords: *Market value, upcycling process, home decorative furniture products, denim, Hiran Ruchi Subdistrict Community in Bangkok*

** The full title of the research project: “The Development of Home Decorative Furniture Products from Denim Through an Upcycling Process to Create the Market Value of the Community in Hiran Ruchi Subdistrict, Thon Buri District, Bangkok”

1. Rationale of the Study

The problem of waste management and unsustainable use of resources is one of the major issues affecting the environment and human health. Handling large pieces of waste, such as mattresses and sofas, is often found to be disposed improperly in water bodies or sewers. In Bangkok, an average of 20 tons of this type of waste is collected every day, which is the main cause of flooding (Krungsri Research Center, 2022c).

One interesting example is denim, a material that is difficult to decompose and is one of the causes of pollution problems. Reusing denim or developing new products from these materials is an important approach to solving environmental problems. This concern was raised in the research of Suansri (2022) on the strategy of adding value of waste fabric products in rural communities. The study reported the use of waste fabrics to create higher-value products in rural communities. Somsri (2019) researched into product design from natural materials and upcycling in community handicrafts, and highlighted the use of natural materials and local waste products to develop handicraft products. Modernform (2023) has shifted to produce eco-friendly furniture in the 'BCG' style.

Quite a few previous studies have shown that most consumers value eco-friendly products and are willing to pay more for products that are designed and manufactured to be environmentally friendly (Pongsiri & Thongmak, 2020; Krungsri Research Center. (2022a, 2022b, 2022c, 2022d; Pattamasiri & Piyawong, 2023). Therefore, the researchers of the present study considered upcycling an approach that can add market value to community products, and therefore pursued a study on upcycled product development in Hiran Ruchi District, Thonburi District, Bangkok, aiming at increasing market value of a specific product selected by the community members.

2. Background of the Study

This section gives background in support of this research: (1) the product development theory, (2) home furnishings made from denim, (3) upcycling concept, (4) market value concept, and (5) circular economy concept.

2.1 The Product Development Theory

Ulrich & Eppinger (2012) pioneered the concept of product design and development. The product development process consists of six main steps—systematically linked procedures that create products effectively meeting market demands. The first step is *identifying opportunities*, which involves exploring the market by researching consumer needs and gaps. Once a business opportunity is found, the next step is *ideation*, where new product ideas are invented and designed to respond to the identified opportunities. The third step is *idea selection*, where the concepts created are evaluated based on factors, such as technical and marketing feasibility, as well as production costs. Once the best idea is selected, the process

moves to *the prototype development stage*, where a prototype is created to test practical applications and gather consumer feedback. Data from these tests are used to improve the product. If the prototype passes testing, it moves to *the product planning stage*, which focuses on production planning, marketing, and managing the necessary resources to meet production targets. Finally, *the product launch stage* introduces the product to the market through promotion and distribution, aiming to reach consumers and generate the desired sales.

The Product Development Theory (Ulrich & Eppinger, 2012) emphasizes that the product development process must go through stages of market research, design, prototype development, and improvements based on feedback from consumers and experts. Applying this concept to home furnishings made from upcycled waste denim helps align the furniture development process with market needs.

2.2 Home Furnishings Made from Denim

The concept of denim furniture is not identified as the work of a particular individual, but rather a concept developed from a combination of Sustainable Design and the process of upcycling, which has become widespread in recent decades. This concept focuses on using materials that are used or wasted in the clothing industry, such as denim, to design furniture that is unique and environmentally friendly. The idea of using denim in furniture design is part of using waste materials to create new value. It was developed from the upcycling process, which focuses on adding value to materials that have been discarded or used. This concept is promoted by the approach of sustainable product design. Many companies and designers have started using denim in their designs, particularly using denim from old clothes to make furniture. This is a concept that is constantly growing in the design industry and many famous designers and brands, such as Droog Design from the Netherlands Furniture made from waste materials, including denim, has been developed, while many brands in Europe and the United States have adopted denim in furniture with high aesthetics and functionality (PEFC Sustainable Furniture Research, 2022). The use of denim in the manufacture of furniture is considered to add value to the rest of the material.

2.3 Upcycling Concept

The process of upcycling is about adding value to waste materials, as opposed to recycling, which often reduces the value of materials. Upcycling theory which emphasizes the use of waste materials to improve it, can be applied to the development of furniture products. The upcycling concept focuses on replacing valueless materials with more valuable goods. This means taking waste materials or discarded materials to improve or develop them into products with higher value or benefits. It is officially stated that the inventor of this concept: the term "upcycling" was about waste management, indicating difference between recycling and upcycling. The concept of upcycling was promoted and expanded more broadly in a book called *Cradle to Cradle Remaking the Way We Make Things* by German designer Michael Braungart and American architect William McDonough in 2002. Upcycling in

designing products aimed to be environmentally friendly. It focuses on designing products that can be continuously reused in the circular economy.

Krungsri Research Center (2022d) emphasized that upcycling can create new sustainable products that can meet the needs of markets interested in environmental conservation. The sustainability design theory suggests that the use of eco-friendly or waste materials, such as denim, can make a difference and add value to a product (Crilly, Moultrie & Clarkson, 2004). In addition to that, furniture products made from sustainable materials are attractive to environmentally conscious consumers.

2.4 Market Value Concept

The concept of market value has been studied and developed by many economists and marketers (Qiao, Shi & Chen, 2022). The origin of this concept comes from the extensive theory of value in economics. Adam Smith's theory (1776), in particular, explained that the economic value of goods depends on the labor used in production. Additionally, Karl Marx (1876) also used the concept of labor value to explain it in terms of political economy. From the perspective of modern marketing and business, the concept of market value has been expanded by many scholars, including Philip Kotler (Kotler, 2016), one of the pioneers in marketing. Kotler described market value as the value that consumers perceive from products and services, based on factors, such as quality, value, satisfaction, and comparison with other products in the market. According to Kotler, market value is not determined solely by the cost of production but by consumers' perception of a product or service's value, which can be enhanced through marketing, communication, and branding. The market value of a product can be increased through emotional enrichment and brand differentiation. In economics, market value has also been discussed in David Ricardo's theory (Ricardo, 1817) of market and value, which focuses on supply and demand in determining the price of goods or services in the market. In conclusion, market value is related to the evaluation of goods' value from the consumer's perspective and its impact on market demand.

2.5 Circular Economy Concept

The Circular Economy is not invented by a single person, but is born from the development of ideas and theories from various fields. The concept was continuously developed during the 20th century with many contributors. But the person who played a key role in making this concept clear and gaining widespread attention was Walter R. Stahel (Stahel, 1976), one of the pioneers of the circular economy concept. Stahel proposed the idea in 1976 through a report to the European Commission that emphasizes the approach of extending the life of products through repairs, reuse and recycling to create a "loop economy" or circular economy. Stahel's concept aims to reduce waste and increase efficiency in resource use. Kenneth Boulding American economist who proposed the concept of "cyclical economy" in the writing of the story *The Economics of the Coming Spaceship Earth* (1966). It proposes that the world has limited resources, so it must be used and circulated sustainably to reduce

loss and impact on the environment. Boulding's concept is considered the cornerstone of the circular economy in the modern era. In the 21st century, the Ellen MacArthur Foundation (2013) has brought the concept of the circular economy to international attention by presenting a clear circular economy conceptual framework and disseminating the approach to sustainable economic development through design, production and waste management. This is in line with the concept of Bocken et al. (2016) that emphasizes the sustainable use of resources in the production cycle. To the researchers of the present study, developing furniture with a circular economy approach will help strengthen the economic value of the community and reduce the impact of waste on the environment.

3. Research Objectives

There were three research objectives:

- (1) To identify the initial problems regarding surplus materials in the community in Hiran Ruchi Subdistrict, Thon Buri District, Bangkok.
- (2) To develop a prototype of home decorative furniture products from denim through upcycling processes to create market value for the community.
- (3) To analyze the relationship between home decorative furniture products made from denim and the upcycling processes that create market value for the community.

4. Research Scope

The research scope in terms of population and location, covers the development of home decorative furniture from denim using upcycling processes to enhance the market value for the community in Hiran Ruchi Subdistrict, Thon Buri District, Bangkok.

4.1 Population

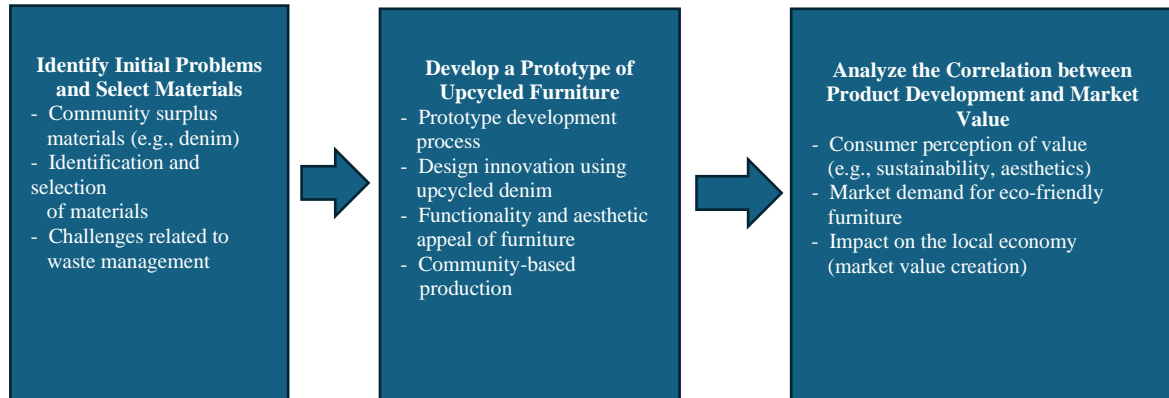
The Bangkok Metropolitan Administration's survey reports the population statistics by subdistrict in the 2022-2023 BMA's annual operational plan. Hiran Ruchi Subdistrict has approximately 10,788 residents with a population density of about 15,612.16 people per square kilometer. It is a densely populated and well-developed area; community entrepreneurs produce home decorative furniture from waste materials particularly denim. This group possesses knowledge about local product production and resources, including the use of discarded materials for product development. In this research, consumers in Bangkok are key target groups that show demand and product value perception toward the upcycling process—leading to market analysis and product value enhancement strategies.

4.2 Location

The research aimed to explore and study local resources, the use of denim and community waste materials, and resource management for developing new products through the upcycling process. Given the issues related to waste and sustainable resource in use, Hiran Ruchi Subdistrict was chosen for its accumulation of waste and discarded furniture materials, which can potentially harm the community's environment.

5. Research Conceptual Framework

Figure 1: Research Conceptual Framework



6. Research Methods

The research methods were in three stages:

6.1 Preliminary Survey according to Objective 1

The researchers investigated the initial problem of waste materials in the community, selected furniture to develop home decoration furniture products from denim by the upcycling process to create market value for the community under study. *Field observation* was done along with *interviews* with community residents, followed by a *focus group discussion* with stakeholders and furniture producers. The researchers looked for data on material types, volume, features, suitability for upcycling, and selection criteria (see Results in Table 1). The interviews on needed data were recorded and transcribed for three product-design experts to examine and consider the suitability analysis of interview items (Index Item of Congruent IOC with a value of 0.76). The researchers surveyed the problem of waste materials at various places in the community, such as houses, shops, or garment shops to collect information on the quantity and types of related waste materials, particularly old denim from the clothing industry, as well as furniture that can be developed into new products by upcycling.

6.2 Design and Development according to Objective 2

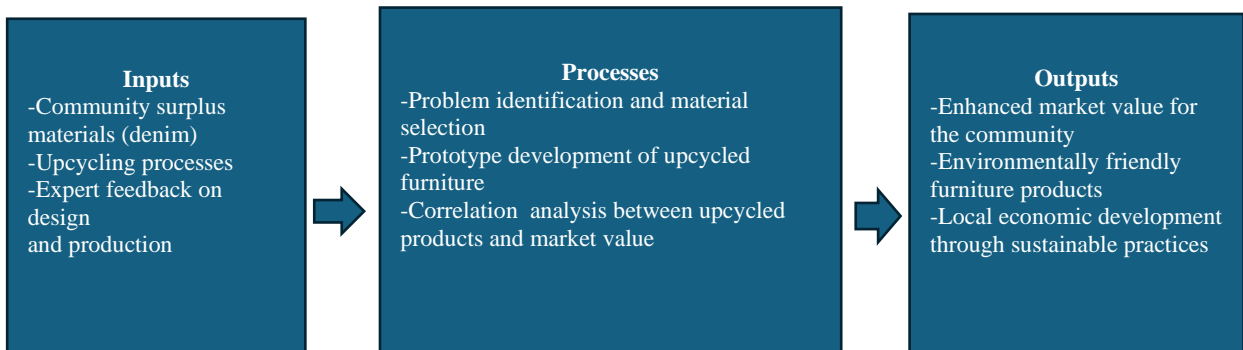
This stage was to develop a prototype product of denim home furnishings with the upcycling process to create market value for the community. The researchers provided three experts with the data obtained in the first stage to consider and recommend the design and development method of upcycled denim furniture products to create market value (see Advice and Method of Operation in Table 2). *The product design expert* advised on furniture design guidelines that meet the needs of the market, such as choosing the right denim fabric, shape design and functionality, as well as the aesthetic value of the product. *The manufacturing*

expert evaluated the production process, taking into account the cost-effectiveness of resource use, waste reduction and overall efficiency in the production of upcycled denim furniture for quality and reasonable production costs. *The marketing expert* analyzed target buyers and market trends to create a product release strategy and plan for promotion of denim furniture products in the right channels to achieve the highest market value.

6.3 Market Experiment and Satisfaction Assessment according to Objective 3

The researchers aimed at bringing the upcycled products developed into the target market both in the community and consumers in Bangkok by using various channels, such as product launch activities to offer the opportunity for interested buyers to try out the product while assessing consumers' acceptance and satisfaction. *The three product-design experts* gave feedback to the final version of the questionnaire on consumers' acceptance and satisfaction before it was distributed to the participants (Index Item of Congruent IOC with a value of 0.76). The participants were asked to respond to the items on product design, product quality, usability value for money, environmental impact, market value creation, and future expectations (see Results in Tables 3 and 4).

Figure 2: Three Stages of Research



7. Results of Data Analysis

This section reports the results of data analysis regarding (i) the preliminary survey on the community's waste materials, (ii) the experts' opinions, (iii) the prototypes of upcycled denim furniture development, (iv) the images of the participants' interview sessions, (v) the activities in upcycled product development, (vi) satisfaction assessment, (vii) the respondents' demographic variables, and (viii) the relationships of other variables via correlation analysis, all as shown in Tables 1-4 and Images 1-4.

Table 1: Results of Waste Material Survey

| Material Type | Volume (Unit) | Features | Suitability for Upcycling | Selection Criteria |
|---------------|---------------|--------------------------------------|---|---|
| Old Denim | 200 kilograms | Durable, suitable for sewing | Old denim from sewing shops and the local clothing industry. This material can be used to design home décor products, such as sofas or cushions. | The old jeans selected should remain in good condition. There are no too many tears or damages, as this will affect the strength of the new product to be developed. |
| Rag | 100 kilograms | It can be used as a decorative part. | Other waste materials, scraps from sewing clothes and old fabrics that are not in use. It can be used in the production process of home furnishings. | It should be a material that allows product design to be more diverse and creative. |
| Old Blankets | 30 pieces | Used as a furniture lining | | |
| Old Furniture | 50-60 pieces | Can be repaired or refined. | Waste old furniture that is discarded or not in use, such as sofas and chairs, per month, which can be improved through new designs with denim to add value to the product. | Old furniture should have a still strong structure. Although some may need repairs, such as replacing the upholstery or replacing the upholstery. It can be used for a long time. |

Table 2: Development of Prototype Denim Home Furnishing Products Using the Upcycling Process to Create Market Value for the Hiran Ruchi Community, Thonburi District

| Expert Type | Advice | Method of Operation |
|-----------------------|---|--|
| Product Design Expert | The product design expert recommended using denim in a way that emphasizes durability, combined with a design that meets the user's needs, particularly enhancing aesthetics and comfort to make the product more attractive and aligned with current market demands. | <p>Examples of products designed using denim and waste materials through the upcycling process are as follows:</p> <p>Denim chairs These chairs are upholstered with old denim fabric for the seat and chair covers. Durability and aesthetics are enhanced by embroidering patterns or adding details from multi-colored denim scraps. They are suitable for decorating homes in either vintage or modern styles.</p> <p>Denim coffee table A table with a textured surface made from denim, cut into small pieces and arranged to create a specific pattern.</p> <p>Denim sofas Small sofas upholstered with multi-colored denim or old jeans used as covers. They are ideal for those who love eco-friendly and creative home decor.</p> <p>Denim cushions These cushions are made from denim scraps and decorated with embroidered or buttoned patterns. They add softness and beauty to sofas or beds.</p> |

| Expert Type | Advice | Method of Operation |
|-----------------------------|---|--|
| <p>Manufacturing Expert</p> | <p>The manufacturing expert recommended to increase production efficiency by taking into account the reduction of waste from the use of waste materials, and to choose economically cost-effective production methods along with maintaining the quality of furniture, as well as the use of technology to increase the cost-effectiveness of the production process.</p> | <p>Production efficiency should be measured in a way that takes into account the reduction of waste from the use of waste materials and the selection of cost-effective production methods along with maintaining the quality of furniture. Reduced waste volume monitoring the amount of waste materials, such as denim scraps that are recycled or reduced compared to previous production. If the amount of waste decreases, this indicates an increase in resource efficiency and cost-effectiveness in the use of materials. The amount of used material can be reproduced into new products with minimal loss. Production efficiency is in terms of time spent in the production process. If the time required at each step can be reduced, it will help to speed up production. Reduce costs and increase productivity in terms of comparing production costs before and after renovation. If the cost is reduced while maintaining the quality of the furniture, it is possible to maintain the quality of the furniture. It shows that there is an increase in production efficiency.</p> |
| <p>Marketing Expert</p> | <p>The marketing expert recommended strategizing how to promote products effectively. The focus is on clearly defining the target audience while building a brand that promotes sustainability and environmental conservation to differentiate itself in the market and attract customers.</p> | <p>In terms of marketing, the target audience should be clearly defined: consumers who care about the environment and those who prefer unique or eco-friendly products that meet the needs of furniture from waste materials. Branding needs to emphasize sustainability values. Product promotion should focus on environmental protection. Reduce waste and use recycled materials to demonstrate social responsibility and make a difference in the market, in terms of using marketing strategies that create a sense of participation, such as organizing activities for customers to experience products or displaying artworks using waste materials. Running campaigns through social media and events will help customers feel more engaged with the brand.</p> |

Image 1: Community Interview Process



Image 2: Prototype Production Process



Image 3: Home Decorative Furniture Products from Denim through the Upcycling Process



Image 4: Prototype Product Exhibition and Satisfaction Survey



As for the statistical analysis of the data obtained from 500 voluntary participants from the community under study, regarding (i) gender, (ii) age, (iii) occupation, and (iv) monthly income, the researchers found that for all variables, including gender, age, occupation, and monthly income, were complete responses from all participants, as follows:

- Gender: The majority of respondents were female, with 238 individuals, accounting for 47.6%, which makes this the largest group in the sample. The next largest group was male, with 207 individuals, representing 41.4%. The other category comprised 55 individuals, making up 11.0%.
- Age: The largest group was between 21-30 years old, accounting for 34.2% of the sample. The second-largest group was between 31-40 years old, representing 26.0%. The smallest group was those under 20 years old, with only 8.6%. Additionally, 68.8% of respondents were 40 years old or younger, while 32.0% were 41 years or older, with 14.0% of respondents at 51 years old or above.
- Occupation: The largest group of respondents were employees, accounting for 35.2%. The second-largest group was university students, representing 19.6%. The other category was 18.0%. The smallest group consisted of retired individuals, accounting for only 4.4%.
- Monthly Income in Baht: The largest group of respondents reported their monthly income within the range of 10,001-30,000, making up 38.2%. The second-largest group earned between 30,001-50,000, representing 22.4%. The smallest group consisted of those earning more than 70,000, accounting for 8.8% of the total respondents.

The average of *the gender variable* is $(\bar{X}) = 1.70$. This value indicates the distribution of respondents between males and females, with the average leaning slightly towards females. The standard deviation (S.D.) = 0.658 shows that the data is not widely spread from the mean. The average of *the age variable* is $(\bar{X}) = 2.94$, which shows that the majority of the sample falls in the mid-range age group. The standard deviation (S.D.) = 1.190 indicates a relatively large variation in age within the sample. The average of *the occupation variable* is $(\bar{X}) = 2.98$, which reflects a fairly even distribution of occupations among the sample. The standard deviation (S.D.) = 1.742 suggests a considerable spread in the types of occupations represented. The average of *the monthly income variable* is $(\bar{X}) = 2.47$, indicating that most respondents fall into a middle-income range. The standard deviation (S.D.) = 1.180 shows a moderate level of variation in income among the sample.

From the respondents' responses, it is clear that the variables are well-distributed, with no missing data. The analysis of means and standard deviations highlights that the sample group is diverse in terms of gender, age, occupation, and income. This data can be further utilized to study relationships between variables or to develop strategies in line with the research objectives.

Table 3: The Relationship between Home Decorative Furniture Products from Denim through the Upcycling Process to Create Market Value for the Hiran Ruchi Community

| | | Product Design | Product Quality | Usability | Value for Money | Environmental Impact | Market Value Creation | Future Expectations |
|------------------------------|---------------------|----------------|-----------------|---------------|-----------------|----------------------|-----------------------|---------------------|
| Product Design | Pearson Correlation | 1 | .118** | -0.012 | .094* | 0.083 | -0.012 | -0.022 |
| | Sig. (2-tailed) | | 0.008 | 0.782 | 0.035 | 0.062 | 0.785 | 0.63 |
| Product Quality | Pearson Correlation | .118** | 1 | -0.008 | .862** | -0.009 | 0.067 | 0.016 |
| | Sig. (2-tailed) | 0.008 | | 0.852 | 0.001 | 0.85 | 0.134 | 0.728 |
| Usability | Pearson Correlation | -0.012 | -0.008 | 1 | 0.002 | -0.015 | .544** | -0.014 |
| | Sig. (2-tailed) | 0.782 | 0.852 | | 0.972 | 0.743 | 0.001 | 0.763 |
| Value for Money | Pearson Correlation | .094* | .862** | 0.002 | 1 | -0.052 | .093* | 0.044 |
| | Sig. (2-tailed) | 0.035 | 0.001 | 0.972 | | 0.247 | 0.037 | 0.324 |
| Environmental Impact | Pearson Correlation | 0.083 | -0.009 | -0.015 | -0.052 | 1 | 0.031 | 0.021 |
| | Sig. (2-tailed) | 0.062 | 0.85 | 0.743 | 0.247 | | 0.495 | 0.634 |
| Market Value Creation | Pearson Correlation | -0.012 | 0.067 | .544** | .093* | 0.031 | 1 | 0.08 |
| | Sig. (2-tailed) | 0.785 | 0.134 | 0.001 | 0.037 | 0.495 | | 0.073 |
| Future Expectations | Pearson Correlation | -0.022 | 0.016 | -0.014 | 0.044 | 0.021 | 0.08 | 1 |
| | Sig. (2-tailed) | 0.63 | 0.728 | 0.763 | 0.324 | 0.634 | 0.073 | |

** . Correlation is significant at the 0.01 level (2-tailed). * . Correlation is significant at the 0.05 level (2-tailed).

Table 4: Pairwise Analysis of Variable Relationships for Home Decorative Furniture Products from Denim through Upcycling to Create Market Value for the Hiran Ruchi Community

| Pair of Variables | Correlation | Level of Correlation | p-value | Interpretation |
|---|-------------|----------------------|---------|---|
| Pair 1 Product Design and Product Quality | .118** | Low | 0.008 | The relationship between product design and product quality was low with a statistical significance level of 0.01. This indicated that a well-designed product tended to have a significant impact on product quality. |
| Pair 2 Product Design and Value for Money | .094* | High | 0.035 | The relationship between product design and value for money was high with a statistical significance level of 0.05. This suggested that a well-designed product had a strong association with customers' perception of value. |
| Pair 3 Product Quality and Value for Money | .862** | Very High | 0.001 | Product quality showed a very high correlation with value for money, with statistical significance at the 0.01 level. This indicated that product quality greatly influenced customers' perception of value. |
| Pair 4 Usability and Market Value Creation | .544** | Moderate | 0.001 | The usability had a moderate correlation with market value creation, with statistical significance at the 0.01 level. This meant that the ease of use of a product moderately influenced its market value. |
| Pair 5 Value for Money and Market Value Creation | .093* | High | 0.037 | Value for money was highly correlated with market value creation with a statistical significance level of 0.05. This indicated that customers' perception of value for money directly impacted the product's market value |

8. Discussion of Results

8.1 Correlation Result 1: Product Design and Product Quality

The correlation between Product Design and Product Quality was 0.118, indicating a very low correlation and statistically significant at the level of p-value = 0.008. Positive correlation indicates that the quality of the design and product improve together. It is a real relationship between the design and the quality of the product in meeting the needs of the market. When applied to denim products, a design that focuses on functionality (e.g., flexibility, durability) and aesthetics will result in a more attractive product. Decorations that create beauty will affect customers' satisfaction. It can set a higher selling price and subsequently build brand loyalty. It also makes the product more competitive in the market. These points correspond with the theory by Ulrich & Eppinger (2012) on the role of design in the product development process and the perception of quality from consumers. Good design can increase the value of the product and make the product stand out in the market, as emphasized by Kotler & Keller, (2016). Good design helps create awareness of product quality and a competitive advantage. Crilly et al. (2004) pointed out that design directly affects the quality assessment of consumers, especially in terms of aesthetics and suitability for use, which affects the perception of product quality. Noble & Kumar (2010) also discussed the

importance of product design in relation to consumer perception of quality in that products with consumer-conscious designs are more likely to be perceived as of higher quality.

8.2 Correlation Result 2: Product Design and Value for Money

The correlation between Product Design and Value for Money at 0.094 (p-value 0.035) indicates that good design plays an important role in making customers feel the worth price and the benefits the product offers. Customer Perceived Value refers to how customers feel that the products they purchase offer a return that is worth the price and the benefits they receive. Well-designed products often help create a positive image for the product, such as beauty, convenience, and functionality that meets customers' needs. These factors all contribute to the perception that the product is "valuable" to the customer. Thoughtful and detailed product design enhances the sense of value, especially when the design makes consumers feel that the product meets their everyday needs. The more a product's design aligns with customer demands, the higher the perceived value will be. This perceived value can influence purchasing decisions and long-term customer satisfaction. When customers perceive a product as valuable, they are more likely to repurchase it or recommend it to others, which helps grow the business. Multiple studies conducted between 2021 and 2024 highlight the importance of product design in influencing customer perceptions of value, particularly in terms of aesthetics and functionality that meet customer needs. For example, Xu et al. (2022) focused on cultural and creative product design, and asserted that designs emphasizing aesthetics and cultural relevance can significantly boost the perceived value of products. Similarly, Qiao et al. (2022) studied the relationship between perceived product value and brand value, highlighting that the perceived value from product design influences brand value through emotional connections and consumer commitment to the brand. This underscores the importance of design that caters to customer needs.

8.3 Correlation Result 3: Product Quality and Value for Money

The correlation between Product Quality and Value for Money has a very strong correlation at 0.862 and a statistical significance level of 0.01. This high correlation indicates that product quality directly and significantly impacts customer perceptions of value. In other words, when the quality of a product increases, the customer's perception of the product's value also increases accordingly. The meaning of this correlation is that when a product has good quality, whether in terms of design, production, or service, customers tend to feel that the product is valuable and appropriate for its price with a good return on investment. The quality of the product in terms of durability, reliability, and functionality that meets consumer needs directly influences the perceived value. Several studies confirm the correlation between product quality and perceived value. For example, Xu et al. (2022) highlighted that the aesthetics and quality of product design have a direct impact on customer perceptions of value, confirming that good design and high quality significantly enhance customers' sense of value. Foroudi (2023) identified product quality and design as key factors in creating competitive

advantages and increasing the market value of products, which clearly impacts customer perceptions of value. Tsiotsou (2016) studied perceived quality and value in the context of services, and confirmed that product and service quality strongly influence consumer perceptions of value and satisfaction.

8.4 Correlation Result 4: Product Usage and Market Value Creation

The correlation between Product Usage and Market Value Creation was 0.544 and the statistical significance at 0.01. This correlation was moderate, indicating that product usability impacts market value creation. In other words, when a product is convenient to use or has good functionality, its ability to increase market value improves significantly. This means that designing products to be user-friendly and suitable for consumers helps create greater market value. This point is consistent with research by the Krungsri Research Center (2022a, 2022b, 2022c, 2022d), which analyzed industry trends in Thailand, emphasizing product design that meets usability needs along with sustainability. For example, products made from recycled materials help increase market value and consumer demand. Pattamasiri & Piyawong (2023) researched into product development from local materials in Thai communities and found that user-friendly design and consumer experience significantly influence market value creation. Pongsiri & Thongmak (2020) also studied the relationship between product design and perceived value in the OTOP market [OTOP One Tambon/district, One Product], indicating that usability-focused design enhances market value and promotes the sustainability of OTOP businesses in Thailand.

8.5 Correlation Result 5: Value for Money and Market Value Creation

The correlation between Value for Money and Market Value Creation was 0.093 with the statistical significance at 0.05, indicating a slightly positive relationship. In other words, when consumers perceive a product as valuable, it leads to a certain increase in the market value of that product. Perceived value refers to the consumers' assessment of a product by comparing the price paid with the quality received. If consumers perceive a product as valuable, that product will be seen as a good choice in the market, potentially increasing its market value, as customer satisfaction may lead to recommendations.

It should be noted that the market value of a product does not depend solely on its quality, but also on how consumers perceive its value in relation to the price and benefits received. According to previous findings from related research over the past five years in Thailand, the perception of a product's value has a clear impact on market value creation. The research on Eco-friendly Furniture Growth in Thailand by Krungsri Research Center (2022a) reported that Thai consumers perceive the value of eco-friendly furniture, with consumers willing to pay 5-10% more if the furniture can reduce pollution and be environmentally friendly. This directly impacts the market value creation of these products. Similarly, PEFC Sustainable Furniture Research (2022) pointed out that sustainability certification in furniture plays a crucial role in building market value. Consumers' perception of certified sustainable

wood furniture holding more value allows manufacturers to set higher prices. Krungsri Research Center (2022b) highlighted that Thai consumers perceive the value of furniture made from eco-friendly materials. It also indicated that the expansion of green buildings in Thailand has significantly stimulated the growth of the eco-friendly furniture market. This point aligns with the DITP research on consumer preferences (Department of International Trade Promotion, 2022) in that the perception of value in eco-friendly furniture influences market growth. Consumers are seeking higher-quality, environmentally friendly products, leading to higher market value for furniture designed with environmental considerations.

As pointed out in earlier discussion on the findings corresponding with theoretical concepts and practices in product design and development, consumers' behavior, and marketing management, the researchers of the present study felt confident of its contribution to the area of upcycled product development as pertinent to communities in Thailand and similar contexts in the ASEAN countries. The research stages of product design and development of upcycled denim furniture can serve as guidelines for furniture entrepreneurs to apply to their actual operations. The exemplified process shows how upcycled furniture investors can add market value to products that move along with the trend of environmental preservation and sustainability.

9. Conclusion

The study was on home furniture made from denim through the upcycling process to create market value for the community in Hiran Ruchi Subdistrict, Thonburi District, Bangkok. It began with a field survey to investigate initial problems related to waste materials in the community, selecting materials to develop home furniture products made from denim through the upcycling process. After the preliminary survey, the research team used the collected data to develop prototype home furniture products. Experts' advice and feedback were sought during the design process to ensure that the products met both aesthetic and functional requirements. Once the prototypes were developed, the research proceeded with an analysis of the relationship between upcycled denim furniture products and market value creation. This analysis helped the research team to understand the impact of product development on consumer perceptions of value and the potential for market expansion.

The results indicate the positive relationship between home decorative furniture products made from denim and the upcycling processes that create market value for the community. The participants under study voiced their opinion that the upcycling approach to furniture product development not only addresses the identified waste problem but also creates potential markets for upcycled products with environmental sustainability value. They felt optimistic about the community's capacity in meeting with the needs of modern consumers that value environmental conservation and sustainability in product development.

The researchers also found that the factors of *environmental impact* and *future expectations* do not have a statistically significant correlation. This could be explained by some possible factors, such as (i) The perceived value of the upcycling process in terms of

environmental impact may not influence future expectations; (ii) Consumers or the community may not view environmental preservation as the main factor influencing their future expectations for these furniture products; (iii) Future expectations regarding a product may focus on other factors, such as durability, value for money, or future market trends, rather than environmental impact. Consumers may not directly associate reducing environmental impact with the future potential of the product; (iv) Some consumers in the community may lack awareness of the environmental benefits of upcycling, resulting in a failure to see the connection between using eco-friendly furniture and creating future value; and (v) Future expectations may rely on other social factors not directly related to the environment. All these points are for entrepreneurs' consideration in planning and crafting marketing strategies that effectively enhance the value of the community's upcycled products.

10. Suggestions

Based on the research findings, the Hiran Ruchi community can use the obtained information to improve prototype products to align with the needs of consumers in the local market as well as using it as a model in developing new products that address sustainability and efficient resource use. The analyzed data on the correlation between *products* and *market value creation* can be used to plan marketing strategies focused on meeting the needs of target consumers, especially those who prioritize value and sustainability. Marketing communication strategies should highlight the unique features of denim furniture that is eco-friendly and the added value generated through sustainable production processes. The research findings can also be used to foster collaboration between the community and various organizations in developing new products that support the local economy. Efficient use of waste resources not only helps reduce waste but also creates jobs and sustainable income for community members.

11. Future Research

In-depth research should be conducted on the behaviors and motivations of environmentally conscious target groups to understand what drives their decisions to purchase eco-friendly furniture. This can help tailor marketing strategies to better meet the needs and expectations of different consumer groups.

As for the efficiency of the upcycling process, further research should examine its long-term environmental impact, not only in terms of waste reduction but also in the efficient use of resources and energy. Future research could focus on developing and integrating new technologies into the upcycling process to maximize production efficiency, or explore the use of other eco-friendly materials and production technologies that reduce energy consumption and minimize environmental impact.

Further research can be conducted on the economic and social impacts of using the upcycling process in furniture development. This could help determine how much job creation, income generation, and long-term support for the community's economy can be achieved.

Potential researchers could explore the opportunities to expand the market for upcycled furniture to international markets. They could focus on understanding the demand in countries

that prioritize sustainable products, as well as how to establish upcycled quality standards and marketing communication in an international context.

12. The Authors

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