

Creating Products to Support Handicrafts and Achieve Sustainable Development

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Abstract: This research investigates the transformative potential of specialized tools in traditional Palm leaves handicrafts in Saudi Arabia, integrating culture, philosophy, and sustainable development. Employing a mixed-method approach, the study conducted two questionnaires—one addressing craftsmen's challenges with tools and the other measuring user satisfaction with the proposed design. With 60 respondents, the methodology combines qualitative insights from in-depth interviews with craftsmen and quantitative data from the surveys. Findings underscore the economic viability of traditional crafts through improved artisanal tools, revealing positive responses from craftsmen regarding the proposed tools' user-friendly design, aesthetic appeal, efficiency, and affordability. The study identifies strategies to preserve traditional crafts, access new markets, inspire younger generations, reduce unemployment, and promote sustainable development. Furthermore, it highlights the positive impacts of marketing Palm leaves products on sustainability, cultural heritage, and philosophical principles. Offering insights for designers and craftsmen, the study advocates for the adoption of advanced tools in Palm leaves making, emphasizing the importance of balancing tradition with innovation in craft production. This research contributes to discussions on handicraft product development, heritage preservation, and sustainable economic growth in Saudi Arabia, bridging culture, philosophy, and economic development.

Keywords: Palm Leaves Handicrafts, Specialized Tools, Cultural Heritage, Sustainable Development, Saudi Arabia, Traditional Crafts.

1. INTRODUCTION

Handicrafts, deeply rooted in the rich tapestry of culture and history (Achille, 2022), stand as one of the quintessential features that define societies, highlighting their customs and traditions (Signes-pont et al., 2022). Across the Arab world, from the Najafi abaya in Iraq to the caftan

in Morocco (Lofthouse & Prendeville, 2018), and from laurel soap in Syria to pottery in Egypt, an astonishing diversity of crafts reflects the cultural richness of the region.

In Saudi Arabia, a country with a profound heritage(United Nations, 2015), crafts and handicrafts have not only endured but evolved into a spectrum of intricate works of art(Mathioudakis et al., 2022)., varying from region to region(Abisuga-Oyekunle & Muchie, 2020).

1.1. Background of the Research

The background of the research unfolds against the vibrant backdrop of crafts and handicrafts in Saudi Arabia, a culturally and economically significant industry valued at one and a half billion riyals annually(Ministry of Culture, 2020). With a focus on the craft of making products from palm leaves, the study recognizes the cultural, philosophical, and historical importance of palm cultivation, proposing specialized tools to overcome challenges faced by craftsmen. Reflecting on the philosophical aspects of preserving cultural heritage through innovative tools, the study underlines the global leadership of Saudi Arabia in date production, emphasizing the indispensable role of its 34.5 million palm trees(Alkhaldi, Emam, & Mosbah, 2022). Palm pruning, a crucial practice, produces versatile palm leaf material, utilized in various applications. However, challenges arise, including environmental concerns and locust infestations(Tawabini, 2023).

In the pursuit of sustainability, the study advocates for innovative solutions, transforming palm leaves into high-value products like fibers, fabrics, furniture, and exquisite handicrafts.

This approach not only addresses environmental challenges but also fosters income generation opportunities and encourages innovation within the rich tapestry of Saudi cultural heritage and philosophical spirit.

1.2. Objectives of the Study

This study is dedicated to the development of palm frond craft tools, guided by cultural and philosophical principles, with the overarching goal of contributing to economic growth, preserving cultural heritage, and promoting sustainable development in Saudi Arabia.

1.2.1 Main Objectives:

1.2.1.1. Economic Growth and Craft Development

Stimulating local economic growth by creating new labor markets compatible with palm leaf handicrafts. Encouraging the growth of small

industries through contributions to the handicrafts sector.

1.2.1.2. Conservation and Sustainable Practices

Preserving the importance of handicrafts from deterioration through resistance to aging. Advocating for sustainable development by promoting traditional crafts in alignment with Sustainable Development Goals.

1.2.1.3. Employment Opportunities

Alleviating unemployment by activating and developing the palm frond craft.

1.2.1.4. Recognition of Cultural and Economic Importance

Recognizing the profound importance of crafts in strengthening national identity and enhancing employment opportunities. Providing insights to revitalize and reorganize the palm frond industry to stimulate economic growth, preserve cultural heritage, and enhance sustainable development efforts. The study also examines the challenges faced by the palm frond industry and compares them to automated products, offering valuable insights for informed strategies.

Table 1 displays the number of palm farms in different regions of Saudi Arabia, highlighting the economic potential of palm waste utilization. Furthermore, Figure 1 presents a statistical analysis of plantations in different regions, emphasizing the significance of the palm frond industry's size.

These findings underscore the economic opportunities and environmental benefits associated with effective palm waste utilization and the development of the palm frond industry. Table 1 presents data on the distribution of palm plantations across various regions in Saudi Arabia. The table is structured to depict the number of farms within different size categories, ranging from less than 500 palms to more than 10,000 palms. Each row represents a different region, with corresponding columns indicating the number of farms within each size category (Vision 2030 Kingdom of Saudi Arabia, 2020).

Legend: The figure presents a statistical analysis of the number of farms in various regions, focusing on palm plantation distribution. For instance, in the Al Riyadh region, there are 18,234 farms with less than 500 palms, 1,780 farms with 500-999 palms, and so forth. The table offers a comprehensive overview of palm plantation distribution, facilitating a detailed analysis of the agricultural landscape in Saudi Arabia.

Table 1: Palm Farms in Saudi Arabia

Regions	Total Farms	More Than 10000 Palms	5000-9999 Palms	4999-2000 Palms	1500-1999 Palms	1000-1499 Palms	500-999 Palms	Less Than 500 Palms
		Farms Numbers	Farms Numbers	Farms Numbers	Farms Numbers	Farms Numbers	Farms Numbers	Farms Numbers
AL Riyad	21125	45	68	328	204	466	1780	18234
Makkah	12098	0	0	2	4	14	137	11941
Madinah.	15190	8	17	141	135	464	1874	12551
Qaseem	13403	84	123	420	197	422	1115	11042
Eastern Region	26173	6	27	95	58	173	753	25061
Aseer	9461	0	1	0	0	25	182	9253
Tabuk	4014	3	2	15	18	77	244	3655
Hail	12294	3	2	17	8	37	221	12006
Northern Borders	209	0	0	1	0	3	3	202
Jazan	161	0	0	0	0	2	0	159
Najran	3552	1	0	4	1	10	72	3464
Al Bahah	1080	0	0	0	0	0	2	1078
Al Jawf	4541	0	3	11	4	41	190	4292
Total	123301	150	243	1034	629	1734	6573	112938

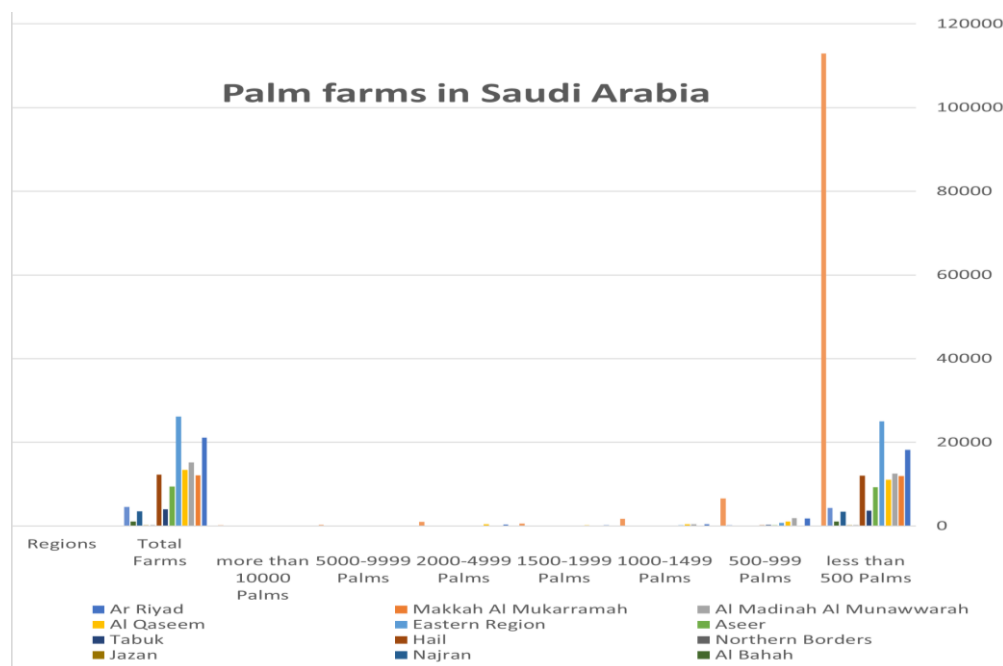


Figure 1: Statistical Analysis of Palm Plantation Distribution in Different Regions.

Note: This statistical analysis was prepared by the researcher specifically for this study.

1.3. Research questions

1.3.1. Main Research Question

How does the introduction of specialized tools for traditional palm leaves craftsmanship in Saudi Arabia affect economic growth and cultural preservation?

1.3.2. Sub-Research Questions

- How do specialize tools and traditional craftsmanship techniques interact to influence the efficiency and quality of palm leaves products?
- What are the key factors that mediate the relationship between specialized tool's introduction and cultural heritage preservation?
- Are there significant regional or demographic differences in the economic and cultural impact of specialized tools implementation in Saudi Arabia?
- To what extent do external factors, like government policies or market dynamics, impact the effectiveness of specialized tools in driving economic growth and cultural preservation in the palm leaves craftsmanship sector?

1.3.3. Exploratory Questions

- What are the perceptions of traditional palm leaves craftsmen and

stakeholders regarding the introduction of specialized tools?

b. How do craftsmen describe their experiences with traditional versus specialized tools in the palm leaves craftsmanship process?

1.4. Research hypothesis

In the context of handicrafts in Saudi Arabia, the hypothesis is that the development and implementation of specialized tools for palm leaf weaving will not only enhance economic viability but will also contribute significantly to the preservation of cultural heritage and are in line with philosophical principles. Designed with a focus on cultural authenticity and sustainability, these tools are expected to bridge the gap between traditional crafts and modern standards, thus promoting economic growth and cultural continuity.

Beyond economic considerations, this research highlights the philosophical foundations of handicrafts and emphasizes their role in enhancing national identity, generating employment opportunities, and preserving cultural heritage. It provides useful insights for reviving and reorganizing the palm frond industry and contributing to informed strategies for economic growth and sustainable development in Saudi Arabia while respecting cultural and philosophical values.

2. LITERATURE REVIEW

2.1. Handicrafts, Philosophy, and Culture

2.1.1. Handicrafts and Their Concept

Handicrafts represent more than just tangible items; they encapsulate heritage, traditions, and ways of life, akin to poetic expressions in the realm of aesthetics. Evolving through time, these crafts seamlessly merge into various industries and professions, emerging as crucial commercial and artistic pursuits (Murray, 2012). They demand not only skill, mastery, and creative focus but also harbor profound aesthetic qualities.

Various definitions shed light on the essence of handicrafts, offering insights into their philosophical and cultural significance (Shafi et al., 2022). They are described as industrial institutions practicing approved crafts based on individual skills and knowledge (Liu, 2023), utilizing prototypes in the local environment or primary production (Lavin, 2019).

These industries rely on special work skills or tools, transforming handmade products into manufactured ones while respecting local heritage and cultural character. They encompass small-scale handicrafts that

prioritize skill and experience over extensive machinery(Mathioudakis et al., 2022) or labor.

These industries engage in artisanal production by hand or with hand tools, contributing significantly to the final product. They possess instrumental, aesthetic, and creative value, reflecting discretionary cultural choices. Artisans are defined as individuals who work unconventionally, embodying the arts and techniques of their community while expressing inherited culture and creativity.

In essence, handicrafts are robust and practical products characterized not only by aesthetic qualities but also by deep-rooted connections to tradition, culture, and religion, serving as symbols with profound social impact across various regions globally.

2.1.2. The Significance of Handicrafts

The significance of handicrafts transcends mere economics(Valenzuela Rubio, 2017), intertwining deeply with national identity and offering a unique charm that mass-produced goods cannot replicate(Shafi et al. 2022). Countries stand to gain significant financial benefits by emphasizing handicrafts, which serve as commercial draws, particularly for tourists(Cooper, 2023) . Moreover, handicrafts contribute to economic expansion, resource exportation, and income generation, playing a pivotal role in recruiting individuals with diverse educational backgrounds, fostering growth, and addressing local challenges.

This recognition aligns with philosophical ideals centered on preserving cultural heritage and promoting sustainable development(Tawabini, 2023). The adaptability of handicrafts allows them to effectively confront challenges and continuously innovate, reflecting a cultural philosophy rooted in resilience and adaptability(Vision, 2030 Kingdom of Saudi Arabia, 2020).

Notable characteristics of crafts include:

- Offering employment opportunities for all age groups.
- Transitioning handmade products into industrial ones.
- Incorporating original patents with various components.
- Minimizing learning costs through training and on-the-job methods.
- Involving multiple members, contributing to balanced development.
- Nurturing creative talents and imaginative skills.
- Requiring minimal capital compared to other ventures.
- Encouraging recycling and reusing waste.
- Promoting the development of environmentally friendly products.
- Upholding excellence, high quality, and trusted customer relationships.

2.1.3. Challenges Faced by Handicrafts

Despite their significance, handicrafts encounter various challenges that hinder productivity. These issues are summarized in Table 2. Addressing these challenges necessitates recognition of the indispensable role that crafts play in national identity, cultural preservation, and economic advancement. Such acknowledgment can pave the way for the implementation of strategies and policies supporting and promoting the handicraft industry, ensuring its ongoing significance and contribution to sustainable development.

Table 2(a): Challenges facing the craft globally

Challenges	Proposed Solutions
Unorganized production base	Encourage the establishment of artisan cooperatives to organize production and enhance collaboration.
Limited market presence	Utilize digital shopping platforms and e-marketing to expand market reach.
Reliance on old and inefficient production methods	Implement skills development programs to modernize and improve production methods.
Lack of financing and limited credit facilities	Facilitate access to funding sources through partnerships with financial institutions.
Asymmetric information about market needs	Conduct market research and trend analysis for effective communication with market needs.
Traditional designs and low-quality raw materials	Encourage innovation in design and the use of high-quality and sustainable materials.
Lack of proper guidance and encouragement	Implement guidance and encouragement programs to provide support and stimulate exploration.
Intense competition from abroad	Enhance international collaboration and participate in global events to market local products.
Youth reluctance to learn traditional crafts	Develop awareness and encouragement programs to attract youth and promote the value of traditional crafts.
Lack of links with the local market	Facilitate communication with the local market through events, partnerships, and community engagement.
Impact of technological development on economic, social, and cultural life	Integrate technology with cultural values and preserve cultural authenticity in products.
Absence of laws protecting traditional crafts	Advocate for laws that protect artisan rights, intellectual property, and promote industry interests.

Table 2(b): Challenges facing the craft globally

Worker shortage due to immigration and negative perceptions	Launch training programs to address labor shortages and attract a new generation of skilled artisans.
Lack of coordination among stakeholders	Establish platforms for coordination among stakeholders to enhance collaboration and efficiency.
Competition with similar imported products	Implement strong marketing campaigns and media initiatives to enhance the appeal of local products.
Lack of promotion and media support	Launch media campaigns to promote traditional crafts and highlight their cultural and economic value.
High production costs	Develop strategies to improve costs through sustainable practices and efficient production methods.

Table 2 summarizes challenges facing the global craft industry and suggests corresponding solutions. Challenges include disorganized production, limited market presence, outdated methods, and financial constraints.

Proposed solutions advocate for organized production, digital market expansion, method modernization, improved funding access, market research, innovation promotion, stakeholder coordination, youth engagement, import competition mitigation, promotional efforts, and cost reduction strategies.

2.2. Sustainable Development

Sustainable development represents a transformative philosophy that goes beyond mere growth(Zhang, 2023), aiming for both economic and social progress through specific qualitative and quantitative changes (Shafi, Sarker, & Junrong, 2019).

Emphasized by the World Commission on Environment and Development in 1987, sustainable development entails meeting present needs without compromising the ability of future generations to meet their own needs. Goals include enhancing quality of life, fostering environmental awareness, rational resource use, and aligning technology with societal goals.

Handicrafts play a vital role in sustainable development, as they are handmade with natural materials and have minimal environmental impact. Artisans utilize resources like wood, bamboo, and natural fibers to create sustainable products, which not only provide local employment and value but also contribute to environmental protection and cultural preservation. This underscores artisans' pivotal role in sustainable transformation, turning simple objects into contemporary designs with significant cultural, utilitarian, and functional benefits.

2.3. Impact of Modern Marketing Techniques on Handicrafts

Marketing dynamics for handicraft products have shifted from traditional methods to modern techniques, particularly electronic marketing (Gallaga & Trujillo, 2022). Leveraging the Internet, electronic marketing is recognized as a cost-effective and accessible means to disseminate information about handicraft products globally (Jayakumar & Nair, 2022). It enhances customer services, reduces promotional costs, fosters healthy competition (Xu & Li 2022), and facilitates access to global markets, thereby adding significant value for customers (Liu, 2023). The adoption of modern marketing methods (Bissett-Johnson and Moorhead 2019), especially e-marketing, plays a crucial role in promoting handicrafts, expanding their global market, fostering competition, and contributing to sustainability. Despite benefits (Nishanbaev, Champion, & McMeekin, 2019), challenges persist (Rani & Brar, 2020), including a lack of market understanding, creativity and innovation issues (Lomas & Xue, 2022), and a shortage of skilled craftsmen (Lerario, 2022). Addressing these challenges requires integrating marketing philosophies and cultural considerations to effectively communicate the unique cultural identity and artistic value of handicrafts to a global audience (Schaathun, 2022).

2.4. Handicrafts in the Kingdom of Saudi Arabia

Saudi Arabia is committed to preserving its cultural heritage by focusing on craftsmen and meeting their development needs (Herman, Filimon, & Herman, 2022). Despite overall development in various aspects of life (MOC-Report 2019), craftsmen across the Kingdom still embrace handicrafts that have remained a testament to the region's historical way of life (Hegazy & Elbana, 2022). Despite some traditional crafts disappearing (Alkhaldi, Emam, & Mosbah, 2022), their deep connection to history and authenticity (Alsughayer, 2021) has enabled their endurance over decades (Tawabini, 2023). Handicrafts hold a significant (Jia, 2022). place in Saudi society (OBG, 2020), encapsulating the Kingdom's historical stages and narrating the tale of an ancient people passed down through generations (United Nations: Department of Economic and Social Affairs, 2022). In its Vision 2030, Saudi Arabia aims to build a diversified and sustainable economy (Ministry of Culture, 2020)., leveraging its substantial investment power (Suleiman et al., 2021). Handicrafts are widespread throughout the Kingdom, with a significant presence in the eastern region. The industry encompasses a wide range of crafts (Alharthi, 2019), from simple industries to elaborate artistic creations, contributing significantly to both cultural heritage and economic vitality (Tawabini, 2023). With

approximately 21,000 craftsmen contributing to its growth(Alsughayer, 2021), initiatives supporting events, financial backing, project development, and marketing are vital for the industry's continued success Figure 2 shows a group of the most famous handicrafts in Saudi Arabia.



Figure 2: Collection of Handicrafts

Legend: The figure showcases a diverse collection of handicrafts captured in a photograph taken by the researcher. The assortment includes items such as ceramics, prayer beads, leather goods, metalwork, woodwork, and products made from palm leaves. Note: This figure is an original photograph taken by the researcher.

2.5. Research Gap

The research identifies a significant gap in the modernization of tools used in palm leaf craftsmanship in Saudi Arabia, despite the region's rich heritage and cultural significance. Traditional tools like Al-Majwab, sickle, knife, blacksmith saw, wood file, and hammer, while culturally valued, exhibit limitations such as inefficiencies and physical strain for artisans. This gap extends beyond a technical deficit; it reflects a broader challenge in sustaining cultural heritage while meeting contemporary needs. The philosophy of preserving cultural practices in palm leaf craftsmanship demands a delicate balance between tradition and modernity. The research emphasizes the need for a comprehensive study and innovation in tools to bridge this gap, aligning with cultural ethos and addressing contemporary challenges. By introducing modernized tools, the project harmonizes tradition with contemporary demands, ensuring cultural practices remain vibrant and relevant. This multifaceted research gap underscores the

intricate interplay between technological advancements, cultural preservation, and the broader philosophy of sustainable development in artisanal practices.

3-RESEARCH METHODOLOGY

The research methodology serves as a guiding pillar, ensuring the study's relevance and applicability for future endeavors. This section delineates the methods employed to gather empirical data on the evolution of tools for handicraft production, emphasizing support for artisans and the elevation of handicraft production, with a keen focus on cultural and philosophical dimensions.

3.1. Mixed Methods Approach: Surveys and Interviews

The study adopted a mixed methods approach, combining qualitative insights from in-depth interviews with artisans and quantitative data from surveys. A total of 60 participants were involved in the research, contributing to both surveys and interviews.

3.1.1. Data Collection Procedure

The data collection procedure included several steps to ensure comprehensive and ethical gathering of information. Informed consent was obtained from each participant prior to data collection. Participants were given the option to complete the questionnaire either in person or online, providing flexibility in participation. For participants selected for interviews, appointments were scheduled at mutually convenient times. The interviews, conducted in structured, semi-structured, or unstructured formats, took place either face-to-face or via video conferencing platforms.

3.1.2. Ethical Considerations

All responses and interview recordings were stored securely to ensure confidentiality, trustworthiness, and data integrity.

3.2. Unveiling Insights: Findings and Analysis

The study reveals insights into the palm leaf craft industry in Saudi Arabia, highlighting its cultural significance and economic impact. With approximately 1.7 million tons of palm waste generated annually (“Date Palm Waste Is a Good Local Substrate for Soilless Culture” 2020)., the date palm holds a unique position in the region's identity, fostering a rich

tradition of handicrafts.

(1). Fibrous Products Industry: Craftsmen utilize palm fiber to create a variety of items, including rope products, bags, baskets, and brooms, showcasing the versatility of this organic material.

(2). Wicker Products Craft: Traditional techniques are blended with contemporary designs to produce mats, dining tables, hats, and umbrellas, particularly in areas with abundant palm trees.

(3). Products from Palm Leaves: Craftsmen demonstrate high skill in creating cages, chairs, beds, and umbrellas from palm leaves, employing simple tools for intricate designs and functional creations.



Figure 3: Collection of Handicrafts Crafted from Palm Frond Waste

Legend: The figure displays a curated collection of handicrafts meticulously photographed by the researcher. This assortment includes various artisanal products crafted from palm frond waste, showcasing the innovative use of this organic material in the crafting process. Note: The photograph was taken by the researcher specifically for this study, capturing the diverse range of artisanal products made from palm frond waste.

Craftsmen's innovative use of palm components exemplifies environmental friendliness and underscores the role of these handicrafts in cultural preservation and economic sustainability. This convergence of tradition and innovation establishes these crafts as vital contributors to Saudi Arabia's rich heritage and economic tapestry.

4. FINDINGS AND ANALYSIS

4.1. Analysis of Palm Frond Artisans' Challenges and Perspectives

A thorough analysis of the challenges encountered by palm frond

artisans was conducted utilizing a comprehensive approach, including personal interviews, visual documentation, and real-time observations. Two meticulously designed Google surveys were administered, with 28 craftsmen participating in the first questionnaire aimed at identifying the issues within the palm leaf manufacturing craft.

Table 3: Demographic Information of Respondents

		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20-30	8	28.6	28.6	28.6
	31-40	6	21.4	21.4	50.0
	41-50	7	25.0	25.0	75.0
	51-60	7	25.0	25.0	100.0
	Total	28	100.0	100.0	

The demographic information of the respondents, as depicted in Table 3, showcases a diverse representation across various age groups. Predominantly, respondents fall within the 20-30 and 41-50 age categories.

Table 4(a): Questions for Collecting Palm Leaf Craftsmen's Issues

Is there any support from different parties to help handicrafts?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	13	46.4	46.4	46.4
	No	10	35.7	35.7	82.1
	maybe	5	17.9	17.9	100.0
	Total	28	100.0	100.0	
Is there an appreciation from the local community for the craftsmanship?					
Valid	Yes	8	28.6	28.6	28.6
	No	12	42.9	42.9	71.4
	maybe	8	28.6	28.6	100.0
	Total	28	100.0	100.0	
What are the most common problems that you face when practicing the profession?					
Valid	Hand tools	18	64.3	64.3	64.3
	cost	6	21.4	21.4	85.7
	Sitting for long periods without moving	4	14.3	14.3	100.0
	Total	28	100.0	100.0	

Table 4(b): Questions for Collecting Palm Leaf Craftsmen's Issues

What problems do you face when using hand tools?					
Valid	Work takes a long time	8	28.6	32.0	32.0
	The product may show some defects	13	46.4	52.0	84.0
	Sizing defects	4	14.3	16.0	100.0
	Total	25	89.3	100.0	
Missing	System	3	10.7		
	Total	28	100.0		

Subsequently, the questionnaire comprised a series of meticulously crafted questions to elucidate the challenges identified through observational analysis. Table 4 delineates these questions, specifically targeting the issues faced by practitioners of the palm frond craft, commonly referred to as " Al-Kafass. "

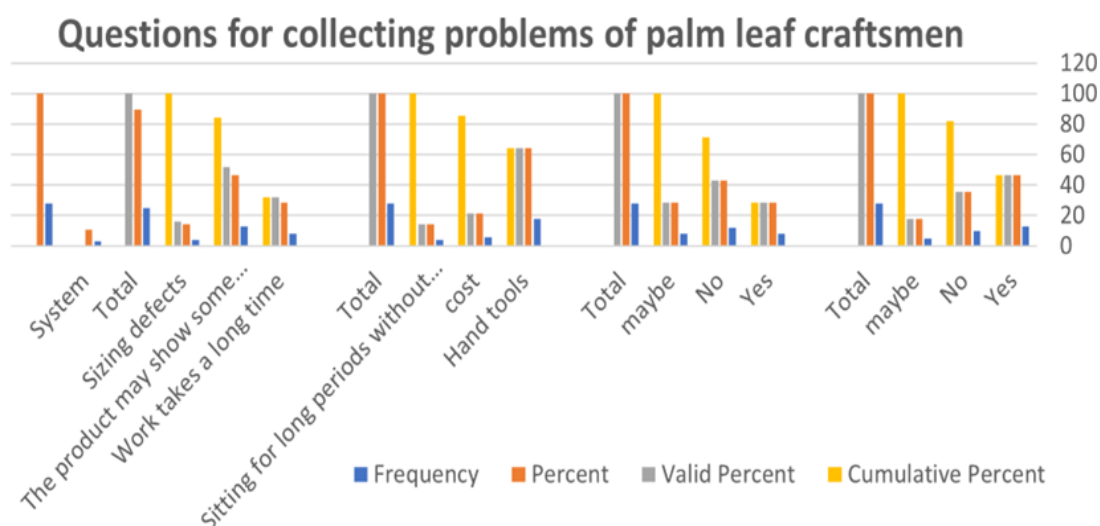


Figure 4: Statistical Distribution of Responses from Initial Questionnaire.

Providing insights into artisan support, community appreciation, common challenges, and specific handicraft problems. The analysis guides potential interventions to enhance the craft industry, based on data meticulously prepared by the researcher.

4.2. Multifaceted Challenges Impacting Handicrafts in Saudi Arabia

The handicraft industry in Saudi Arabia faces multifaceted challenges detailed in Table 5, ranging from disorganized production processes to reliance on traditional designs. Solutions are proposed to address these obstacles, emphasizing a holistic approach that encompasses modernization, skills development, and marketing support to safeguard

cultural heritage.

Table 5: Responses to Identified Challenges

Challenges Confronting Handicrafts in Saudi Arabia	Impediments	Suggested Solutions
Disorganized Production Process	Hinders efficiency and effectiveness	Streamline production processes
Outdated and Inefficient Production Methods	Hampers progress	Adopt modern production techniques
Persistence of Traditional Designs	Impedes contemporaneity	Introduce contemporary designs
Lack of Guidance and Encouragement	Hinders skill development	Provide guidance and encouragement
Competition with Imported Products	Faces stiff competition	Enhance product differentiation
Young Generations' Aversion to Learning the Craft.	Reluctance to engage in traditional crafts	Promote apprenticeships and training
Impact of Technological Progress	Induces changes across domains	Embrace technology in craft production
Absence of Protective Laws for Artisans	Poses a critical challenge	Implement protective legislation
Inadequate Trade Marketing and Media Support	Compounds challenges for craft products	Strengthen marketing and media support

Table 5 presents the responses gathered from palm frond artisans regarding the challenges encountered in their profession. Responses are organized based on the questions outlined in Table 4, providing valuable insights into the level of support, community appreciation, common issues, and specific challenges related to hand tools.

4.3. Unveiling Craftsmanship Practices: Insights from In-Depth Analysis and Application

Insights from questionnaire responses and interviews unveil profound challenges affecting palm frond craftsmen, particularly regarding traditional tools and working conditions. The analysis underscores the need for a paradigm shift in tools and methodologies to attract the younger generation to the craft while preserving cultural heritage. Strategic interventions are proposed to modernize and revitalize palm frond craftsmanship.

4.4. Advancing Sustainability through Innovative Design Solutions

Exploring the sustainability of palm frond craftsmanship, the research

acknowledges the abundant yield from the pruning process and the vast scale of palm cultivation in Saudi Arabia. Noting the variation in palm frond sizes and the time-consuming nature of surface leveling and perforation processes, the study introduces innovative tools that significantly enhance efficiency. These tools streamline the crafting process, reducing perforation time to mere seconds while honoring cultural heritage and artistic tradition.



Figure 5: Technique and Tools in Palm Frond Crafting

The image, taken by the researcher, sheds light on factors influencing young people's reluctance to join the craft and the challenges encountered by palm leaf artisans.

4.5. Innovative Design Solutions

The proposed design offers a tailored solution to address the unique requirements of palm leaf craftsmen, seamlessly integrating functionality and efficiency. Central to its design is the inclusion of two side drawers strategically positioned to optimize the workflow of craftsmen. One drawer serves as storage for palm leaves designated for punching and leveling operations, while the other acts as a repository for completed palm leaf components, facilitating easy access during assembly. Figure 6.



Figure 6: Design in Inactive Condition

The figure displays the product in its inactive state, emphasizing the integration of a thoughtfully designed table and chair to enhance artisan ergonomics. Unlike traditional seating, this model offers a more precise and comfortable arrangement, aiming to improve the overall working experience for artisans.



Figure 7: Proper Utilization of Drawers and Seat

The figure illustrates the effective utilization of drawers and seat, catering to essential tasks like surface leveling and perforating palm leaves. Dedicated sections on the table streamline these operations, with a specialized component facilitating surface leveling guided by rotating iron cylinders. This design enhances the efficiency of palm leaf craftsmanship by simplifying surface preparation and perforation processes.

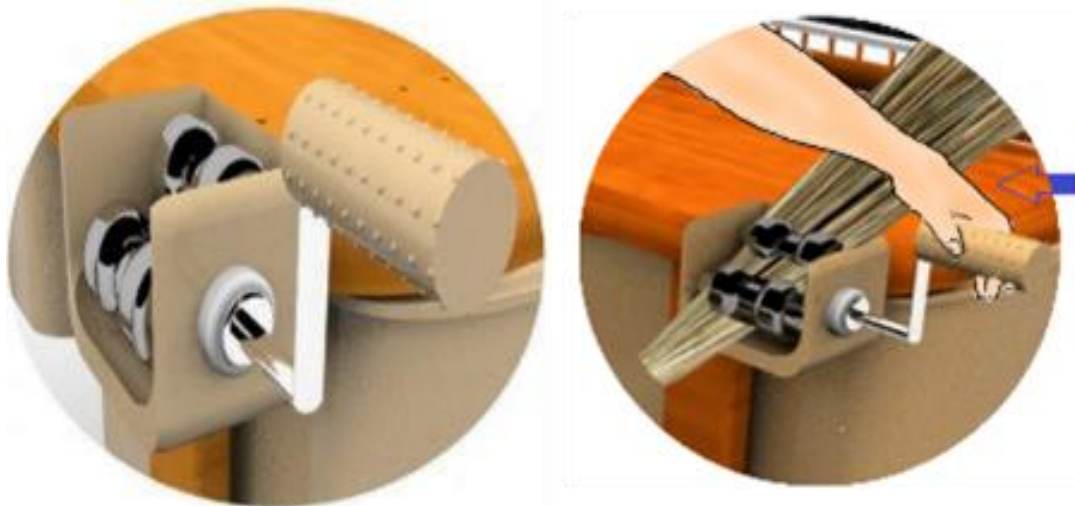


Figure 8: Palm Frond Planing Technique

The figure depicts the palm frond planing technique, a crucial step in the fabrication of palm frond products. The design's simplicity facilitates effortless execution with minimal exertion, as demonstrated by the

straightforward process of positioning the palm leaves and employing manual movements. Significantly, this method is intentionally crafted for user-friendliness, eliminating the need for electricity or extensive training.

Note: This image underscores the user-centric design approach aimed at simplifying the palm frond planing process, thereby enhancing accessibility and efficiency for craftsmen.

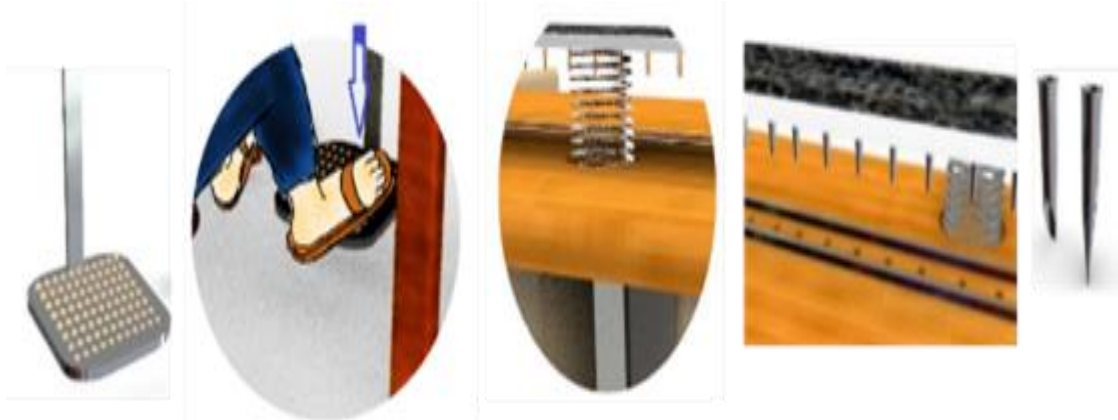


Figure 9: Palm Frond Surface Leveling Technique

The figure illustrates the process of leveling palm frond surfaces using a specialized table with a punching mechanism, crucial in palm frond product manufacturing. After the scraping process, palm leaves are placed on the table for perforation. The craftsman activates the foot-operated perforation machine, akin to a sewing machine, enhancing efficiency and accuracy. The design allows for interchangeable drill bits, diverse drilling patterns, and regulation of hole numbers. This innovative design replaces traditional tools, ensuring precision without advanced technology. Perforation is a fundamental and streamlined step in palm leaf manufacturing.



Figure 10: Ideal Artisan Work Environment

Legend: showcases an optimized artisan work environment, designed to

enhance comfort, efficiency, and aesthetics. It features ergonomic seating, organized workflow, and aesthetic elements, promoting a systematic and visually appealing workspace. This design minimizes defects in palm leaf cutting and fosters productivity and inspiration among artisans.

5. RESULTS

5.1. Exploration of Tradition and Challenge

- The study delves into the intricate balance between tradition and challenges within palm frond craftsmanship.

- These challenges, deeply rooted in cultural heritage, shape artisan efficiency and pose reflective hurdles for the younger generation.

5.2. Cultural Anchors and Artistic Impediments

- Challenges related to traditional tools reflect cultural anchors deeply ingrained in the artisan's heritage.

- These impediments, influenced by cultural, philosophical, and artistic values, challenge craftsmanship efficiency.

5.3. Imperative Shifts

- The analysis highlights the necessity of a paradigm shift, advocating for transformative changes in tools, methodologies, and working conditions.

- This insight lays the foundation for interventions that modernize the craft while preserving its intrinsic values.

5.4. Harmony of Nature, Culture, and Craftsmanship

- Design solutions, informed by palm tree yield and the connection between nature and culture, promote sustainability.

- Palm cultivation in Saudi Arabia provides a backdrop where agriculture and tradition harmonize, reflecting cultural heritage.

5.5. Embracing Organic Diversity:

- Variation in palm frond sizes, influenced by factors like palm type and age, celebrates organic diversity in raw materials.

- Each frond becomes a unique expression of nature's artistry, transcending mass production and embodying artisanal philosophy.

5.6. Craftsmanship as Artistic Expression

- Craftsmanship is viewed not just as a skill but as artistic expression,

observed during pivotal processes.

-Innovative tools mark a shift towards artistic exploration, enriching the artisan's journey.

5.7. Bridging Tradition and Innovation

-Efficiency gains with innovative tools bridge tradition and innovation, blending past and future seamlessly.

-This bridge ensures craft sustainability while honoring cultural heritage, embracing modernity's dynamism.

5.8. Preservation of Essence in Modernity

-Proposed design solutions integrate functionality and efficiency, preserving Saudi Arabian handicraft traditions in a modern context.

-The approach reflects a commitment to balance tradition, culture, and artistry, ensuring a legacy for future generations.

In summary, these results reflect a philosophical journey where challenges inspire inquiry, and craftsmanship evolves as a profound expression of culture, philosophy, and art, fostering a symbiotic relationship between tradition and modernity.

6. DISCUSSIONS

6.1. Setting the Philosophical Stage

Our exploration is anchored by two meticulously crafted questionnaires. The first, a literary overture, sets the stage for the second – an inquiry into the satisfaction and effectiveness of the proposed product in the realm of palm leaf craftsmanship. The second questionnaire, adorned with images and explanations, delves into the thoughts of those deeply rooted in the art form. Table 6 unfolds as a tapestry, portraying age groups and specializations, each contributing to the rich cultural narrative.

Table 6(a): shows the sample of judges for the design.

		Age		Valid Percent	Cumulative Percent
		Frequency	Percent		
Valid	20-30	7	21.9	21.9	21.9
	31-40	11	34.4	34.4	56.3
	41-50	7	21.9	21.9	78.1
	51-60	4	12.5	12.5	90.6
	otherwise	3	9.4	9.4	100.0
	Total	32	100.0	100.0	

Table 6(b): shows the sample of judges for the design.

		Career			
Valid	Craftsman	15	46.9	46.9	46.9
	Craft researcher	11	34.4	34.4	81.3
	Industrial designer	3	9.4	9.4	90.6
	otherwise	3	9.4	9.4	100.0
	Total	32	100.0	100.0	

Table 6 summarizes the judges' demographics. The majority are aged between 31-40 (34.4%), followed by 20-30 (21.9%) and 41-50 (21.9%). In terms of career, craftsmen make up the largest proportion (46.9%), followed by craft researchers (34.4%) and industrial designers (9.4%).

6.2. Harmonizing Efficiency and Tradition

-The design emerges as a symphony, blending heightened efficiency and user-friendly attributes with the traditional melodies of craftsmanship.

-Survey results resonate as craftsmen acknowledge the design's efficiency, aligning with our pursuit to minimize physical exertion and elevate the essence of craftsmanship.

6.3. Upholding Artistic Autonomy

- Craftsmen's control over hole numbers and punching tools becomes a highly valued aspect (96.9%), safeguarding not just the quality of the product but the artistic autonomy of craftsmen.

6.4. Philosophical Reflections on Craftsmanship

- The minimal difficulty rating (3.1%) reflects the ease with which craftsmen traverse the transformative journey from raw material to artistry.

- Craftsmen's belief (93.8%) in productivity gains reflects a conviction in the transformative potential of the proposed product.

6.5. Prioritizing Safety and Satisfaction

- Safety considerations (96.9%) embody a commitment to artisans' well-being, reflecting the intertwining of craftsmanship and human security.

-Table 7 and Figure 12 transcend quantitative representations, offering nuanced insights into craftsmen's satisfaction.

Table 7: displays responses.

Is the design format appropriate to the nature of the craftsman's work?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	30	93.8	93.8	93.8
	maybe	2	6.3	6.3	100.0
	Total	32	100.0	100.0	
Does the design of the punching tools in the developed form perform the job efficiently and more easily than the traditional tools					
Valid	Yes	30	93.8	93.8	93.8
	maybe	2	6.3	6.3	100.0
	Total	32	100.0	100.0	
Does the freedom to change punch tools and control the number of holes available in the product facilitate the work of the craftsman?					
Valid	Yes	31	96.9	96.9	96.9
	maybe	1	3.1	3.1	100.0
	Total	32	100.0	100.0	
Do you find any difficulty in using the proposed product?					
Valid	Yes	1	3.1	3.1	3.1
	No	27	84.4	84.4	87.5
	maybe	4	12.5	12.5	100.0
	Total	32	100.0	100.0	
Do you expect the product to raise the productivity of the craftsman?					
Valid	Yes	30	93.8	93.8	93.8
	maybe	2	6.3	6.3	100.0
	Total	32	100.0	100.0	
Is the product safe for the craftsman?					
Valid	Yes	31	96.9	96.9	96.9
	maybe	1	3.1	3.1	100.0
	Total	32	100.0	100.0	

Table 7 summarizes responses regarding the proposed product design. Questions encompassed aspects like design appropriateness, punching tool efficiency, flexibility, ease of use, productivity increase, and safety. Overall, responses showed a high level of satisfaction and optimism towards the product, with the majority answering positively.

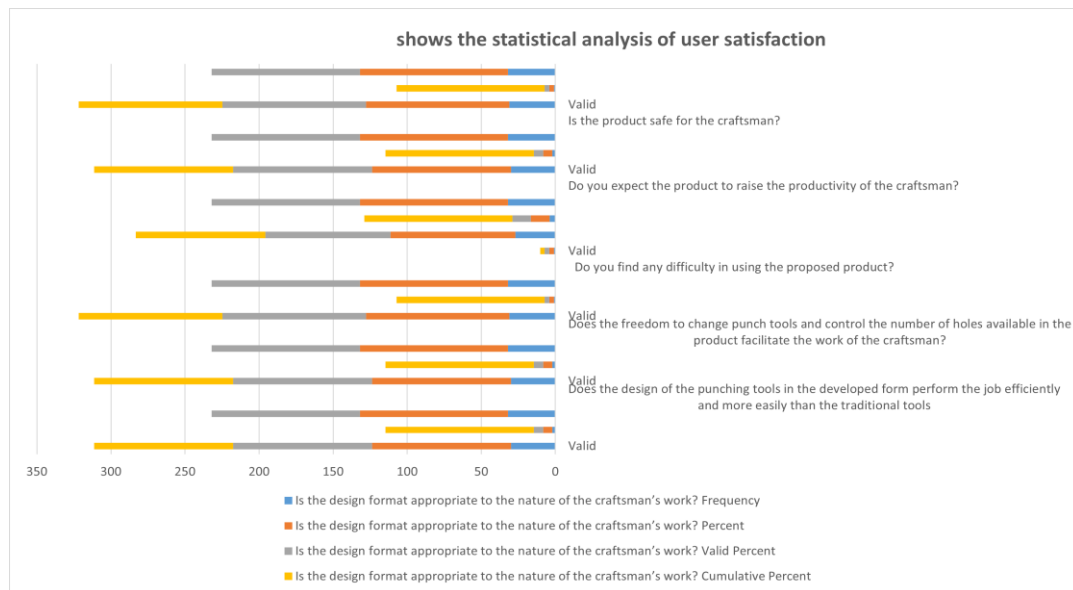


Figure 11: Statistical Analysis of Second Questionnaire

Legend: The figure displays the statistical analysis derived from the second questionnaire administered to evaluate the proposed design. This graphical representation provides a comprehensive overview of the collected data, enabling a detailed examination of the responses received. By presenting the data in a visual format, Figure 11 facilitates the identification of patterns, trends, and correlations within the dataset, enhancing the understanding and interpretation of the research findings. This analysis serves as a crucial component in assessing the effectiveness and feasibility of the design solution proposed in the study, contributing to informed decision-making and further research endeavors.

6.6. Charting Future Directions:

-Future directions serve as philosophical signposts, guiding a journey of continuous enhancement and improved symbiosis between craftsmanship and innovation.

6.7. Unveiling the Tapestry of Palm Leaf Craftsmanship

-Our comprehensive exploration unveils the intricacies of palm leaf craftsmanship, weaving together threads of tradition, innovation, and their delicate interplay.

6.8. Ecological Considerations in Cultural Fabric

-Environmental significance (1.7 million tons of palm waste) prompts philosophical reflections on the interconnectedness between the environment, culture, and the role of palm leaves in Saudi Arabian life.

6.9. Navigating Challenges as Philosophical Enigmas

-Industry challenges spur philosophical discourse on overcoming hurdles, highlighting the transformative potential of innovative tools in craftsmen's hands.

6.10. The Genesis of Artistic Revolution

-The groundbreaking product symbolizes the genesis of an artistic revolution, embodying the fluidity of art, innovation, and the craftsman's journey.

6.11. Sustaining the Soul of Craftsmanship

-In summary, our study serves as a philosophical manifesto, envisioning not just a future for palm leaf craftsmanship but a sustainable future that preserves its essence in the evolving tapestry of Saudi Arabian cultural heritage.

7. JUSTIFICATION OF RESEARCH OBJECTIVES

7.1. Economic Growth and Craft Development

-Stimulating local economic growth through palm leaf handicrafts creates new labor markets, aligning with the journal's focus on economic development strategies.

-Encouraging small industries within the handicrafts sector contributes to economic diversification, a key theme of interest for the journal's readership.

7.2. Conservation and Sustainable Practices

-Preservation of handicrafts aligns with the journal's emphasis on sustainability and cultural heritage preservation.

-Advocating for sustainable development through traditional crafts resonates with the journal's interest in promoting environmentally friendly practices.

7.3. Employment Opportunities

-Alleviating unemployment by developing the palm frond craft corresponds with the journal's focus on social impact and job creation.

7.4. Recognition of Cultural and Economic Importance

-Recognizing the cultural significance of crafts and their role in national

identity aligns with the journal's interest in cultural studies and economic sociology.

-Providing insights to revitalize the palm frond industry addresses economic challenges while preserving cultural heritage, a topic of interest for the journal's multidisciplinary readership.

Overall, the research objectives contribute to the journal's mission of promoting sustainable economic development, cultural preservation, and social well-being. The examination of challenges and opportunities in the palm frond industry offers valuable insights for scholars, policymakers, and practitioners interested in sustainable development and cultural economics.

8. CONCLUSION

8.1. Embracing Tradition with Vision

Our study underscores the vital role of handicrafts as guardians of cultural heritage, seamlessly blending tradition with contemporary creativity. With unwavering confidence, we affirm the enduring relevance of artisanal craftsmanship in shaping cultural identity and fostering a sense of belonging.

8.2. Turning Challenges into Opportunities

Despite facing stagnation in artisan tool evolution, we view these challenges as catalysts for transformative growth. With a philosophy rooted in resilience and innovation, we are poised to harness these challenges as springboards for revitalizing the palm leaf craft, breathing new life into its cultural significance.

8.3. A Visionary Design for Sustainable Progress

At the core of our research lies a visionary design proposal—a testament to our commitment to sustainable and ecological craftsmanship. With confidence in our collective vision, we see this proposal not merely as a tool for enhancing efficiency but as a symbol of our dedication to environmental stewardship and cultural preservation.

8.4. Empowering Artisans, Empowering Communities

Beyond technical support, our approach to empowering artisans embodies a holistic philosophy—one that nurtures creativity, resilience, and a profound sense of cultural pride. With unwavering belief in the transformative power of artisanal craftsmanship, we envision a future

where our artisans thrive, and our community's flourish.

8.5. A Renaissance for Saudi Arabia

As we embark on this journey of revitalization and renewal, we do so with a deep sense of purpose and conviction. With confidence in our ability to effect positive change, we stand poised to usher in a renaissance for the handicraft sector in Saudi Arabia—one that celebrates our cultural heritage, drives economic prosperity, and inspires generations to come.

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APPENDICES

1. APPENDIX 1: PALM FROND CRAFTSMANSHIP QUESTIONNAIRE

1.1 Demographic Information

1. Age:
2. Gender:
3. Years of Experience in Palm Frond Craftsmanship.

1.2 Craftsmanship Experience

4. Traditional Techniques and Tools:
 - Description of techniques and tools used in palm frond craftsmanship.
5. Main Challenges:
 - Challenges faced as a palm frond artisan.
6. Innovative Solutions:
 - Encountered innovative solutions or tools improving craft.

1.3 Craftsmanship Support and Challenges

7. Support from Parties:
 - Support from different parties to help handicrafts.
8. Appreciation from Community:
 - Local community's appreciation for craftsmanship.
9. Common Problems
 - Most common problems faced when practicing the profession.
10. Hand Tool Issues
 - Specific problems faced when using hand tools.

1.4 Cultural Significance

11. Significance in Society
 - Cultural significance of palm frond craftsmanship in Saudi Arabian society.
12. Contribution to Heritage
 - Contribution to preserving cultural heritage and identity.

1.5 Sustainability and Environmental Impact:

13. Waste Minimization:
 - Measures taken to minimize waste and promote sustainability.
14. Environmental Initiatives:

- Initiatives or practices within the palm frond community promoting environmental conservation.

1.6 Future Perspectives:

15. Vision for Future:

- Vision for the future of palm frond craftsmanship considering changing societal trends and technological advancements.

2. APPENDIX 2: EXPLORING PALM FROND CRAFTSMANSHIP - INTERVIEW GUIDE

2.1 Introduction:

1. Background and Experience:

- Overview of Experience and Background in Palm Frond Craftsmanship
- Motivation Behind Pursuing Palm Frond Craftsmanship

2.2 Traditional Techniques and Tools:

- Description of Traditional Techniques and Tools Utilized in Palm Frond Craftsmanship
- Commonly Used Tools and Their Application
- Challenges or Limitations Associated with Traditional Methods or Tools

2.3 Cultural Significance:

- Cultural Significance of Palm Frond Craftsmanship in Saudi Arabian Society
- Contribution of the Craft to Preserving Cultural Heritage and Identity
- Observations on Changes or Adaptations in Palm Frond Craftsmanship Over Time

2.4 Challenges and Innovations:

- Main Challenges Faced as a Palm Frond Artisan, Particularly Regarding Tools and Techniques
- Encounter with Innovative Solutions or Tools Enhancing Craftsmanship
- Balance Between Traditional Methods and Modern Innovations

2.5 Sustainability and Environmental Impact:

- Discussion on Sustainability Aspects of Palm Frond Craftsmanship,

Specifically Environmental Conservation

- Methods of Sourcing Palm Fronds and Measures Taken to Minimize Waste

- Initiatives or Practices Aimed at Promoting Sustainability within the Palm Frond Community

2.6 Future Perspectives:

- Vision for the Future of Palm Frond Craftsmanship Considering Societal Trends and Technological Advancements

- Anticipated Opportunities or Challenges for Next Generation Palm Frond Artisans

- Recommendations or Suggestions for Enhancing Support and Recognition of Palm Frond Craftsmanship

2.7 Conclusion:

Thank you for your valuable insights and contributions to our research, which will greatly enrich our understanding of palm frond craftsmanship and inform the development of innovative solutions to support this traditional art form.

3. APPENDIX 3: QUESTIONNAIRE TO EVALUATE DESIGN FACTORS AND EASE OF USE IN THE PALM FROND INDUSTRY.

3.1. Age:

- 20-30
- 31-40
- 41-50
- 51-60

3.2. Career:

- Craftsman
- Craft researcher
- Industrial designer
- Otherwise

3.3. Is the design format appropriate to the nature of the craftsman's work?

- Yes
- Maybe

3.4. Does the design of the punching tools in the developed form perform the job efficiently and more easily than the traditional tools?

- Yes
- Maybe

3.5. Does the freedom to change punch tools and control the number of holes available in the product facilitate the work of the craftsman?

- Yes
- Maybe

3.6. Do you find any difficulty in using the proposed product?

- Yes
- No
- Maybe

3.7. Do you expect the product to raise the productivity of the craftsman?

- Yes
- Maybe

3.8. Is the product safe for the craftsman?

- Yes
- Maybe