Independence and Interdependence of
Sustainable Spaces

USER EXPERIENCE IN TRADITIONAL DOMESTIC PREPARATION PRODUCTS IN DIFFERENT CULTURES OF SRI LANKA
Special reference to String Hopper Press ("Idiappa Wangediya")

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Abstract: Traditional domestic manual handling products have many unique characteristics according to cultural backgrounds. Although to complete one task, people are using different products in different contexts in Sri Lanka. These products have cultural (Sinhala, Tamil, Muslim) related practices, thinking patterns and different user experiences with a specific context. But after globalization these products have been developed and replaced with other products. Therefore, user perspectives, behaviors, and relationships with cultural products and users have changed. Therefore, research contains user experience in String Hopper Press *("Idiappa Wangediya")* and its variations in many other cultures in Sri Lanka. Samples are selected according to the current use and available products in the market. The analysis is based on User Experience theories. Finally, traditional products used in different cultures have different user experiences that are gained from cultural values. Therefore, it is hard for users to adapt to other products from different cultures and hard to change usual behaviors with the product.

Keywords: User Experience, Cultural Influence, Emotional Experience, Product Development, String Hopper Press

1. Introduction

In Sri Lanka, many traditional domestic manual handling products give knowledge of Sri Lankan cultures, production process, materials, and contexts. Some are still used in the local contexts with improvements, but most products are replaced with new products which come from other countries. The products which are discussed in this research are developed with functions, materials, and forms used in different cultures. Some of these products follow a wealthy design development process which is done with User Experience because some functions and processes are inherited from the culture. It is most important to think about these factors when it came to food preparation products or food-based cultural products. These food preparation processes influenced and combined with other cultures. Therefore, these processes and ingredients differ from culture to culture, and products differ with user preferences according to culture. This research aim at discussing differences of traditional preparation products in different cultures with user experience. The case study selected as string hopper press *("Idiappa wangediya")* which has many varieties of products. String Hopper Press products different with materials, forms, functions, user perspectives and emotional experience according to Sri Lankan cultures than the other products. This research includes the user experience of different cultural stages of string hopper presses and analyses the development of the products. The research provide to find specific processes to apply founded knowledge in a modern context to develop cultural products or help to design and innovate products that gives a Sri Lankan impression.

2. Literature Review

Traditional products were designed with traditional knowledge which are innovations and practices of Indigenous and local communities in the world. Traditional products are the products that developed with the cultural creative knowledge and inherited social, cultural background from their context. Therefore, traditional products are different from culture to culture because of different social influences, nature, weather, beliefs, norms, and behaviors.

As the idea of Don Norman, the inventor of the term "User Experience" suggests that there is no such thing as an individual when it comes to products. A product is more than the sum of its parts. It is a whole, integrated series of past events. Consider all stages of a product or service, from initial goals to final reflections, and from first use through assistance, service, and maintenance. It must make sure they are together on the same page (Dosunmu, 2019). User

experience does an important part in developing a product or service in a specific context. Even in the traditional product design, one can see the involvement of the knowledge in user experience. It is relative to an individual's cultural framework, view of the world, and past daily life experiences, when a product appeals to an individual (Roberts, 2001). Traditional products not only have functions, but they also give a sense of cultural identity (Hou, 2020). There are different kinds of string hopper presses that can be found in Sri Lanka (B. S. U. Mendis, N. T. Medagedara, D. C. Wijewardena, 2015).
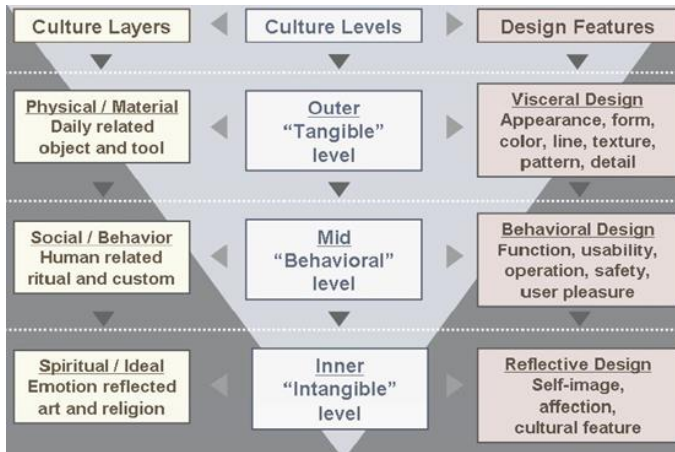

According to Donald A. Norman, every three levels of emotional experience as the tangible level, the behavioral level, and the intangible level include visceral, behavioral, and reflective design features (Norman, 2003). When studying traditional products in cultures, this is the most suitable developed framework. Therefore, this could support identifying the differences of products in the cultures using user observations and studies.

Figure 1, the three levels of cultural objects and design features (*Source: Lin, R. T. (2007))*

3. Methodology

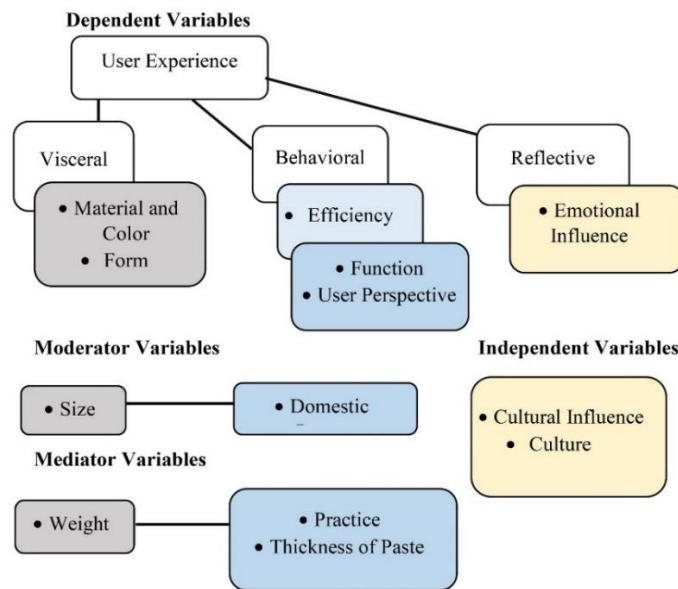To discuss differences of traditional preparation products in different cultures, one could use their preference. According to the case study (string hopper press) chosen for the research, independent, dependent, moderator, and mediator variables were selected. Moderator variables as size and domestic purpose are selected when the pilot study is done to select sample products for the case study. Mediator variables as practice, the weight of the product, and thickness of paste is selected when doing the experiment and observation.

In the first stage, samples were analyzed using design features, materials, forms (handles, pressing heights, body shapes), textures and patterns, according to cultural preference. In the second stage, samples were analyzed with experiment data which is done to identify user behaviors (holding, pressing, put on try, noodle cutting, remove parts and cleaning), function, and efficiency with their practiced product and other products.

Figure 2, Conceptual Framework *(Source: Authors creation)*

The third stage analyzed emotional influence in products. Research was conducted by close-ended questionnaires, interviews, and observations using qualitative and quantitative research methods. To gather information, this survey consists of fifteen elderly people aged above 45, who are from different cultural backgrounds in Sri Lanka.

Figure 3. Product categorizing according to function and main Detachable Components of products
(Source: Authors creation)

For experimental observation, participants were named according to cultural groups as, Sinhala – (S), Indian Tamil – (IT), Sri Lankan Tamil – (ST) and Muslim – (M).
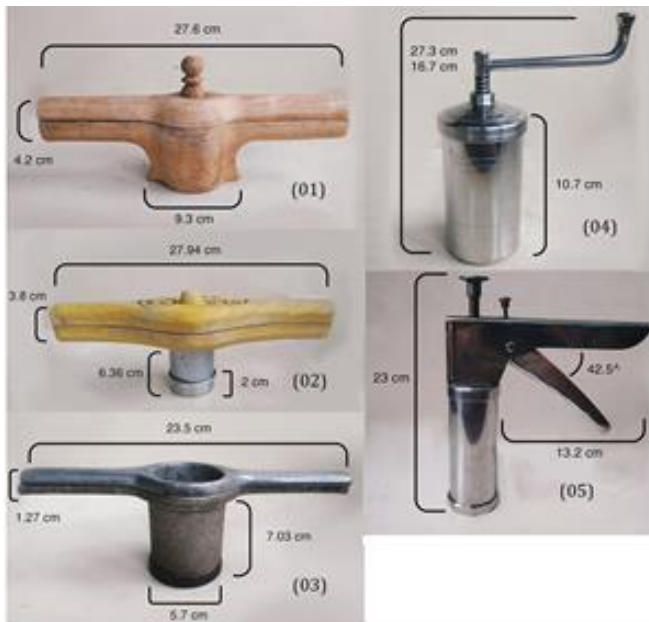

Figure 4, Selected Products numbering *(Source: Authors creation)*

Table 1, Selected Product weights
(Source: Authors creation)

No.	Product	Weight
01	Sri Lankan wood String hopper press	300 g
02	Sri Lankan wood and plastic String hopper press	280 g
03	Stainless steel String hopper press	250 g
04	"Chakli press" or Indian String hopper press	390 g
05	Stainless steel Cookie press – As String hopper press	500 g

4. Emotional Experience and Tangible level Analysis

The tangible level analysis includes material, form, and pattern analysis of products which include products' initial impression and feeling with the user.

Table 2, Material selection for products in methodology *(Source: Authors creation)*

Category	Participants for Pre-Questionnaire														
	S1	S2	S3	S4	S5	ST1	ST2	ST3	IT1	IT2	IT3	M1	M2	M3	M4
Wood	+	-	+	-	+	+	+	+	+	-	-	+	-	+	-
Mix	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum	-	+	-	+	-	-	-	-	-	+	-	-	+	-	+
Brass	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-

Sinhala and Sri Lankan Tamil users like to choose Sri Lankan wood products for their kitchen products, but Indian Tamil users prefer metal products and Muslim users prefer both wood and metal products.

Table 3, Handles, Pressing Heights, Angles and Body shapes of products *(Source: Authors creation)*

Handles, Pressing Heights and angles and Body shapes of products	Values
  and most of the users prefer the handles on Product 03. All three products have curved shapes on the upper side of the handles, and they are easy to use.	Product 01 has a triangular shape which most users had an uncomfortable feeling with the shape. Product 02 had a wide area than Product 01 and it was less hard for users. Product 03 has the most developed handles, which are made with Aluminum. Therefore, it has a simple rectangular shape
Product 01 = 10.3 cm Product 02 = 8.9 cm Product 03 = 7.6 cm less paste can reduce the hard work with pressing but will result in many rounds to complete the full task of making string hoppers. There are different sizes of hands, while most female hands are small, male hands are large and	The first 3 products have the same function to pressing, but they have different heights of pressing. User has to maintain preferred distance in any product, which suits their hand size. The user's preferable size can be identified according to the volume of the string hopper paste going to be filled, and the user's hand size. Putting

strong. Therefore, the product has less handle distance to press, which is easier for a female user. Products 04 and 05 have different functions. Therefore, they have different types of handles to do the work. All the users have a positive feeling about the product 05 handle.

All products have different body parts, which are used to store the string hopper paste. Product 01 has an aesthetically pleasing body shape with curves, and other products have cylinder shaped bodies, and other directly combined parts. Other 4 products have cylinder shaped body and have detachable parts like the disk and the ring.

Table 4, Comfortability of Form and Function from impression and experience *(Source: Authors creation)*

Category	Participants for Pre-Questionnaire														
	S1	S2	S3	S4	S5	ST 1	ST 2	ST 3	IT 1	IT 2	IT 3	M 1	M 2	M 3	M 4
Form I	+	-	+	+	+	+	+	+	+	-	+	+	+	+	+
Form II	o	+	o	o	o	+	-	+	+	+	+	+	+	o	+
Form III	o	o	o	+	+	o	+	o	o	+	o	o	o	o	+

Most users tend to use Form I string hopper presses as a comfortable form from their experience. All Sri Lankan Tamil and Muslim users choose Form I as a comfortable form. Form II is the second most comfortable form to them. All Indian Tamil and most Sri Lankan Tamil and Muslim users have selected Form II. All cultural people rarely selected Form III because most of them have not experienced it before, but their impression of Form III was positive.

Table 5, Textures and Patterns in disks, rings, and body *(Source: Authors creation)*

Textures and Patterns in disks, rings, and body	Values
Products 01, 03, 04, and 05 have circular pattern holes. Product 02 does not have a visible pattern; it has an unstructured holes pattern. Product 04 has six disks to gain different shapes of noodles. Five of those disks has circular pattern holes and one has a liner shape hole.	
	These grips on the paste mold rings help to change disks according to the required size of the noodle. Product 03 has a texture around the paste mold part that gives a metallic grip.
and it supports the function according to the users. Product 05 has the pattern on its handle which is used to press. It has a curved pattern that fits the user's hand and helps with the movement of the product to reduce any loss of grip with the hands.	Product 04 has line patterns around the presser and the paste mold. Pattern in the paste mold helps to produce a sturdy grip with the hand

5. Emotional Experience and Behavioral level Analysis

The behavioral level analysis includes function, user perspective, user behaviors, and efficiency analysis of products which include usability and performance of the product.
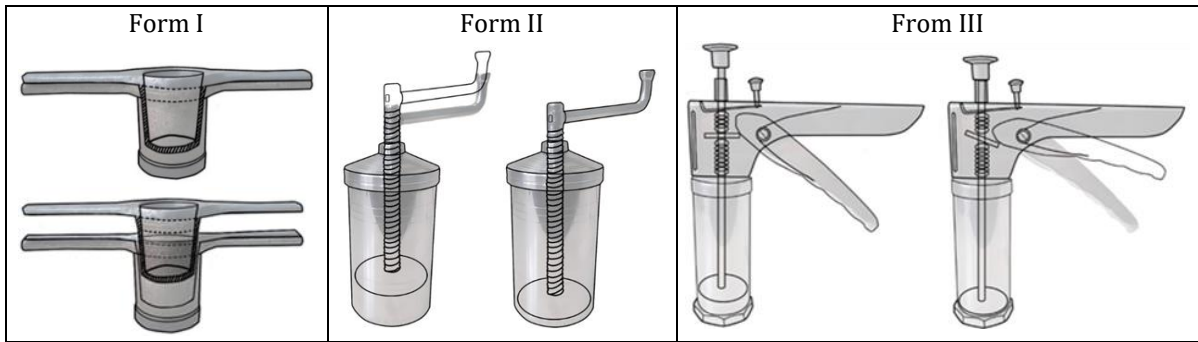
Figure 5, Function diagrams / Pressing Mechanism of Product Form I, II and III *(Source: Authors creation)*

Products 01, 02, and 03 have the same function of pressing but it is different from the structure of the product. Product 01 and 02 structures have similarities such as having a knob on presser, similar sizes of handle heights, and most importantly having a solid presser unlike Product 03 which has a hollow presser designed to reduce the weight of the product. Product 04 has a pressing mechanism with a combination of handle, rotation pole with threads, and pressing plate. Clockwise rotation will add pressure for pressing and anticlockwise will remove the pressure. Therefore, user perspective was different with the product because of the movement. Product 05 has a complicated mechanism but has a simple function. The function is the same as in the paper clip which connects to a torsion spring to create force.

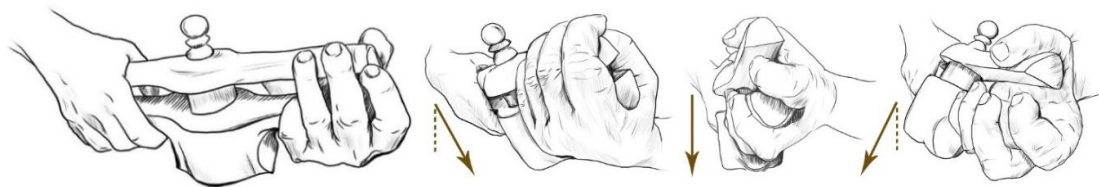Figure 6, User Behaviors of Holding and filling ways of Product 01, 02 and 03 *(Source: Authors creation)*

Figure 7, User Behaviors of Holding and pressing angles of Product 01, 02 and 03 *(Source: Authors creation)*
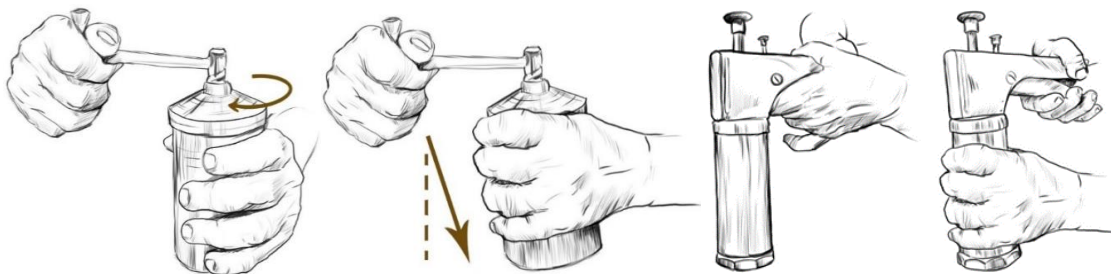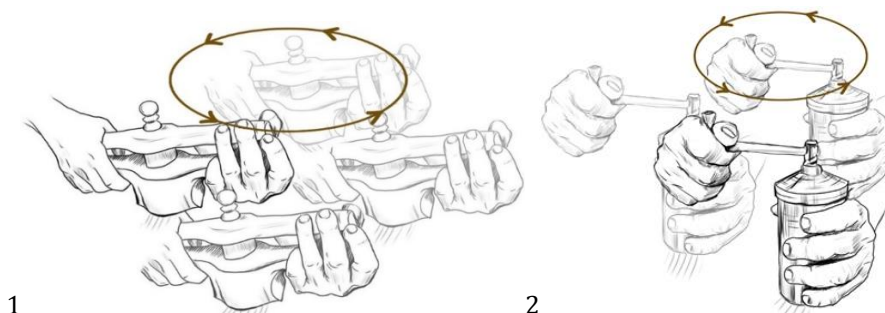

Figure 8, User Behaviors of Holding and pressing way of Product 04 and 0*5 (Source: Authors creation)*
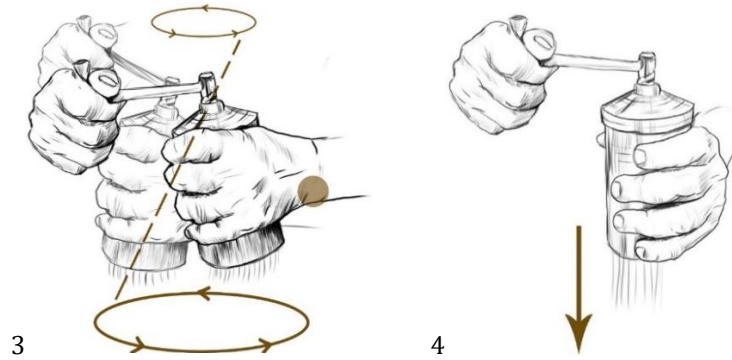
Figure 9, Product 01, 02, 03, and 04 circular and straight ways of noodle put. (Source: Authors creation)

Sri Lankan Tamil and Indian Tamil users tend to put noodles circularly with cone shape patterns. The product is moving around the tray using the wrist of the hand. It gives more comfort while using the product without moving both hands. Muslim user tends to hold it straight because they are mostly using Product 04 to make 'Murukku', which does not require the hands to move in a large circular pattern around the tray. Therefore, holding straight is one of the easier ways to put noodles on the tray, and comfortable as the cone shape pattern but less comfortable than the spiral pattern. But Sinhala user found it easier than the working pattern due to cultural differences, lack of knowledge in the product and practice.
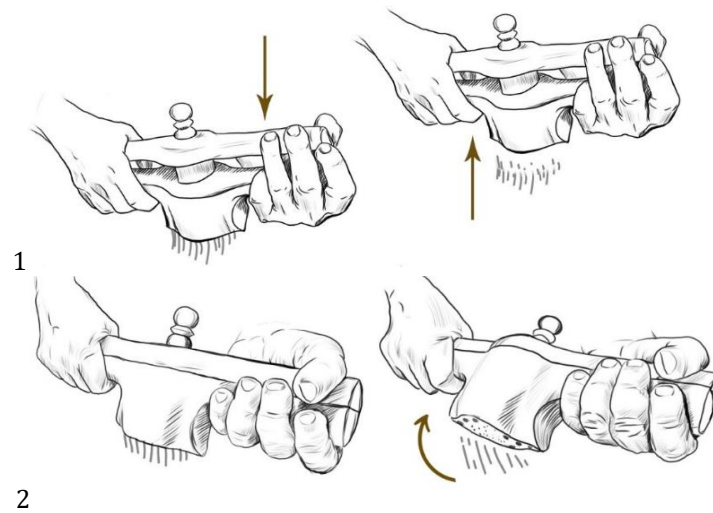

Figure 10, Product 01, 02 and 03 down-up noodle cut and turning noodle cut *(Source: Authors creation)*

Product 01, 02, and 03 has the same 3 ways to cut noodle and Product 04 and 05 has one way to cut noodle. One way is to put the product down and lift it at once. Then the noodle becomes thin and detaches from the product. Another way is to hold and turn the product in one axis at once as shown in figure 10. Then the noodles will become thin with each rotation until it detaches from the product. These first 2 ways of noodle cutting are used by users who have more practice with the product.

Figure 11, Product 01, 02 and 03 finger noodle cut *(Source: Authors creation)*

According to user behaviors, cultural differences in pressing ways of products can be identified. Mainly in Product 04. Other behavioral differences identified in the process could not be defined as cultural differences. Behaviors of filling, holding, cutting, removing, and cleaning has many variations, which are mainly influenced by family backgrounds.
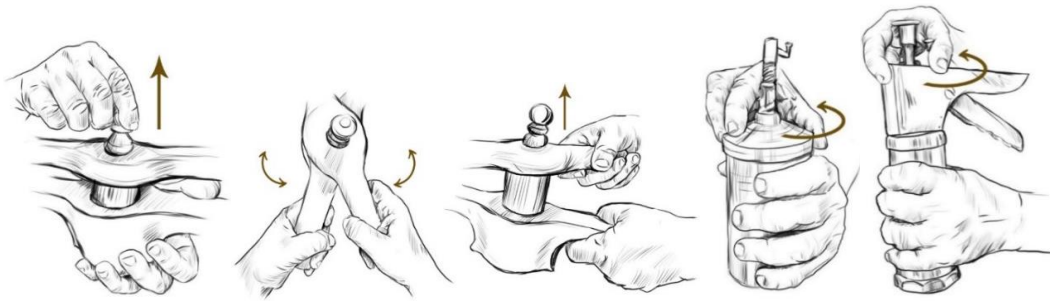
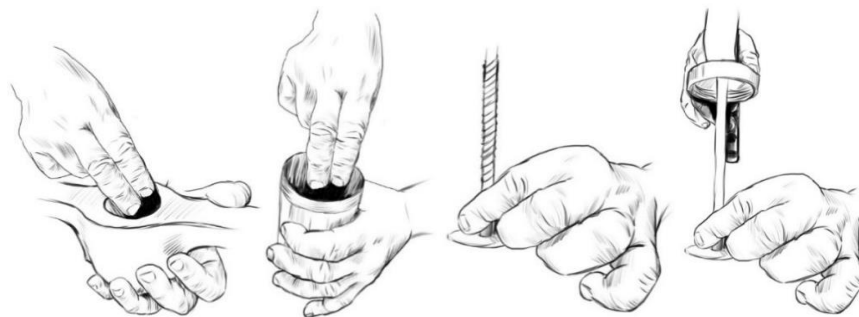Figure 12, Product 01 removing presser at first *(Source: Authors creation)*

Figure 13, Cleaning paste mold of products *(Source: Authors creation)*

Table 6, Overall Positive and Negative effects of products with User Perspective *(Source: Authors creation)*

Product	Participants for Interview (I) and Observation (O)							
	S1		ST1		IT1		M1	
	I	O	I	O	I	O	I	O
01	+	-	+	+	-	-	+	+
02	+	-	+	-	-	-	+	+
03	+	+	+	+	+	+	+	+
04	-	-	+	+	+	+	+	+
05	+	+	+	+	-	+	+	+

User perspective of the users was different before and after experiencing the products with their culture and memories. Sinhala users had positive feelings about Product 01 and 02 although after experiencing it became negative. User was friendly with the product because of cultural and emotional influence though experiencing it without practice gave more difficulties. Sri Lankan Tamil user had the same feelings as Product 02 because the product was made with many materials that did not give the user a pleasant feeling. Indian Tamil user had difficulties with Product 05 at first because of its weight and unfriendly function. Although after experiencing user had a positive feeling about Product 05. When considering overall products, Products 01 and 02 had the most negative responses about the products and Sinhala user had negative responses about Product 04.

Table 7, Efficiency calculation *(Source: Authors creation)*

Product	S4		ST3		IT3		M4		1 min max
	In 1 min	%	In 1 min	%	In 1 min	%	In 1 min	%	
01	3	60%	4	80%	4.5	90%	5	100%	5
02	3	60%	4	80%	4	80%	5	100%	5
03	12	100%	10	83.3%	10	83.3%	12	100%	12
04	3	46%	4.5	69.2%	6.5	100%	5	76.9%	6.5
05	12	100%	10	83.3%	8	66.6%	9	75%	12

According to the calculation, the maximum number of string hoppers made in one minute gives a specific idea about their practice with their product and other products. Sinhala user had practiced with Product 03 and 05. There is a high difference in the Form I category with Sinhala user because of form changing. Among other users, there are not that many differences in Form I category products, but still, they have high efficiency with Product 01 and 02 than the Sinhala user. Indian Tamil user showed high efficiency in Product 04. Muslim user has high efficiency with Form I product because of practice and has 76.9% efficiency with Product 04.

6. Emotional Experience and Intangible level Analysis

Emotional influence with the user's cultural product were analyzed and combined with the emotional influence they gain from other products after experiencing them. Most of the users use current products because those products were used by their family members such as their mothers and grandmothers or else because of the cultural value. Some are used because it was available in the Sri Lankan market. User aspects mainly change with easiness of working steps from filling to cleaning, working efficiency, material preference with culture and emotions with product in family background. Products 01 and 02 have the most negative overall feelings and Products 03, 04, and 05 have the most positive feelings. According to cultural differences, Sinhala user had a negative feeling about Product 04 and Muslim user had a positive feeling about Product 02.

Table 8**.** Product 01, 02, 03, 04 and 05 emotional experience in different steps *(Source: Authors creation)*

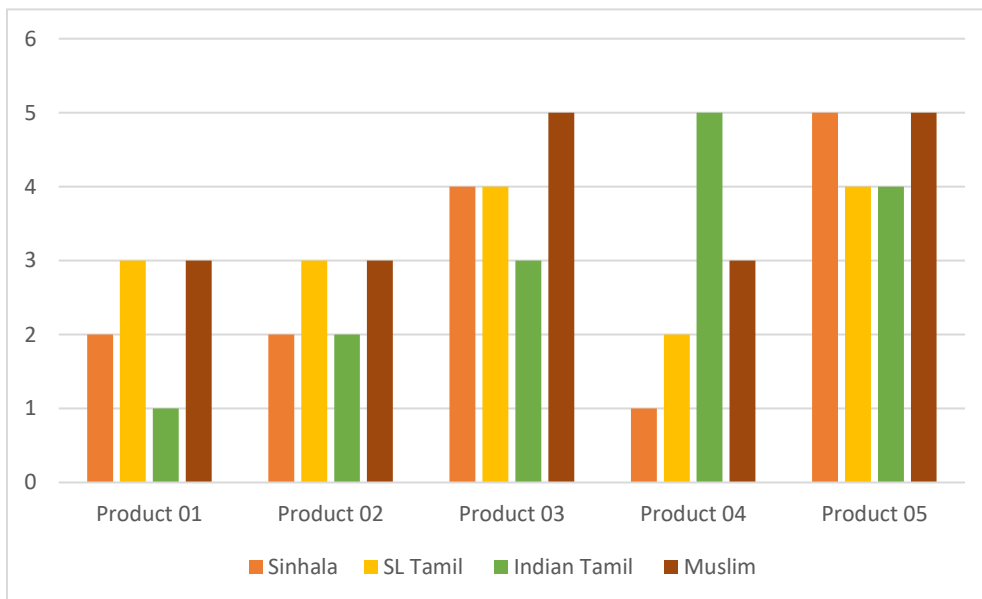| Product	User Aspects				Overall emotional experience			
	Easiness (handles, pressing)	Efficiency	Material Preference	Emotions with product	S	ST	IT	M
01	-	-	+	+	-	-	-	0
02	-	-	-	-	-	-	-	0
03	+	+	+	+	+	+	+	+
04	+	+	+	+	-	+	+	+
05	+	+	+	+	+	+	+	+

7. Discussion

Figure 14. Product Evaluation by users. *(Source: Authors creation)*

7.1. SINHALA CULTURE
Sinhala people make string hopper with rice flour, salt, and water. They use water amount to get the specific thickness of the dough. Most of them use wood sting hopper press (01) and stainless-steel cookie press or multi-purpose string hopper press (05) because they have given high value to these products. Most of them have practice with Product 03 and like to use wood products and metal (Aluminum) products. Most of them changed from wood product to metal product because it is easy to use with small pressing handles. They tend to use these products because of emotional influence gained from family. Most of them like curved and aesthetically pleasing appearance of the wood product (Table 3) because most cultural products use materials such as wood and stone and they felt familiar with product. Behaviors with the traditional straight press function is friendlier than other cultural functions with rotating handles. There is high efficiency in both products with straight press (Table 7). Most of them tend to rotate the product around on the trays, therefore, they use Product 04 in the same way (Figure 9, 2) and get a negative impression about the product. Furthermore, they think it easy to press than rotating because of the smoothness of the dough. Although they have a good feeling with Product 05 which have a mechanism because of its function. They use natural made trays because of health issues. But some of them use plastic trays.

7.2. SRI LANKAN TAMIL CULTURE
Sri Lankan Tamil people make string hopper the same way as Sinhala people, but they have experience with both Indian products as well as Sri Lankan products. Sri Lankan Tamil group use wood sting hopper press (01), Mix material string hopper press (02) and stainless-steel cookie press and multi-purpose string hopper press (05). Most

of them do not like to change their wood product to other products, therefore, they use Product 02. Most of them blend with Sinhala and Indian cultures, therefore they have similar thoughts about shapes and patterns. They are most friendly with Product 02, 03 and 05 because they are all straight press products and they used to practice it from their family. They use Indian string hopper press (04) to make "Murukku" (bites). Therefore, they have some practice with the product, but they do not prefer to make string hoppers using Product 04. They prefer decorated textures and patterns on product. They use both plastic and bamboo or cane trays.

7.3. INDIAN TAMIL CULTURE
Indian Tamil people make different varieties of string hoppers including Indian cultural string hoppers which are made with steamed dough and regular dough. Most used product is Product 04, and they use it for multiple uses. Most of them like brass products (Table 2) because of their material preferences in culture and they could not use those because brass products are rare in the Sri Lankan market. Most people like to use metal products because of their family backgrounds. They pay attention to product details, and they tend to use products with more patterns. That shows their cultural interests in products. They put noodles on the tray in a corn shape pattern (Figure 9, 3) which is the easiest way to use Product 04. Most people tend to lift the pressing part fully to open the Product 04 and they use trays made from bamboo or metal.

7.4. MUSLIM CULTURE
Muslim people blend with Tamil and Sinhala cultures, languages, and products in Sri Lanka. Most of their products are similar to Tamil culture. They have high efficiency with most of products because of blended cultures in Sri Lanka. They are using Product 04 to make "Murukku", but they were also good with the product because they have practice. They were good with Product 02, 03, 04 and 05 and have a good knowledge of using products (Table 7). They like metallic appearance and simple shapes. According to gathered data, as a culture they like to try many products that make work easier.
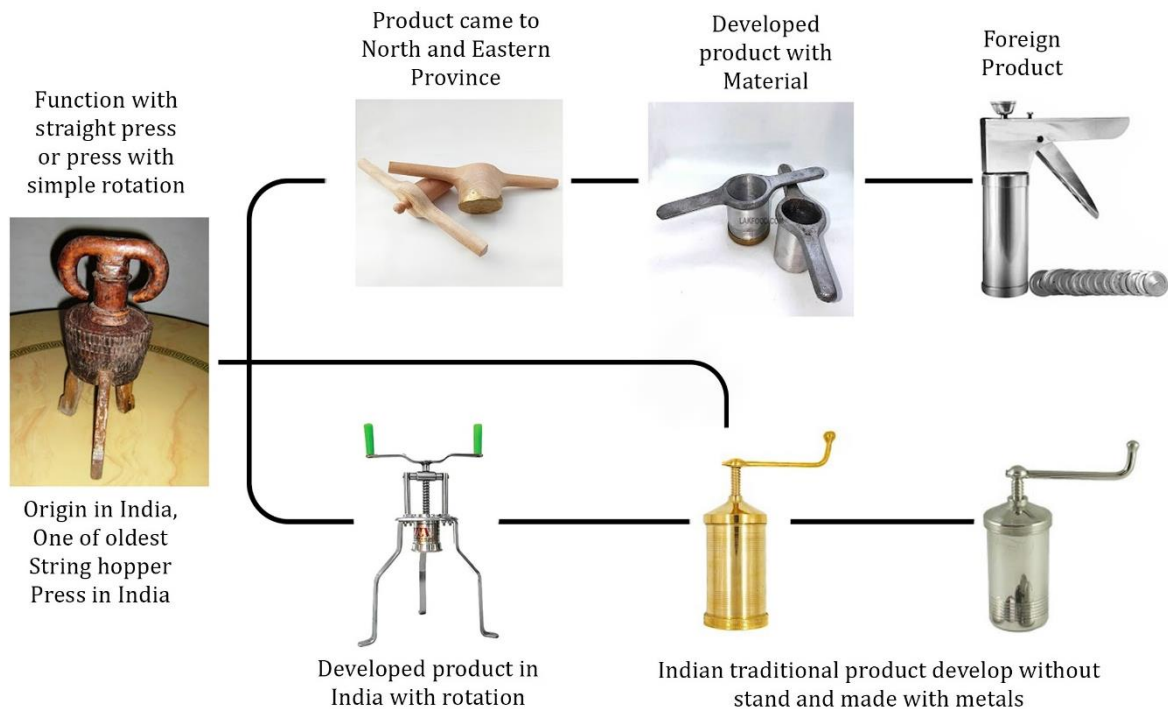

Figure 15. Development of Traditional Products and uses in cultures *(Source: Authors creation)*

8. Conclusion

User experience is different and interesting according to cultural differences in Sri Lanka. The knowledge of user experience related to traditional products is the most important task when designing or developing a product for a cultural group. Most people use traditional products that they have used from the past and the user experience of these products has changed mainly according to function, mechanism, and user behaviors. Other variables as form, shape, material, pattern, and emotional influence change according to other cultural influences, beliefs, values, and function of the product. Cultural groups do not have many difficulties with their cultural product, although they have to face some problems while using other cultural products. Mainly in String hopper press product, when holding and pressing the string hopper. When the same cultural group has different environmental and blended cultural conditions the results can be changed as they could handle most cultural products easily with their knowledge and practice.

The string hopper press has been made with many materials. Although cultural people chose wood or aluminum because of their preferences and perspectives of healthy food or cleaning. Then the products show their development

process including material and form with user experience. Form mainly changes in handles, although in new products body shapes has been changed. Material selection on this product is based on function and mechanism. Overall appearance and feel of the product have changed with cultural groups, as Sinhala culture used curve shapes and Tamil culture used many parallel lines.

User's performance can be changed with user behaviors. User behaviors could be similarly related to one or two products, although when it comes to products that are used for the same purpose in other cultures, users may have found it difficult. Then user performance gets lower percentage because they do not have practice or idea about how to use the product comfortably. There is a high difference between Sri Lankan products and Indian products according to user's product evaluation. Therefore, traditional products that are used in different cultures have different user experiences that are gained from cultural values, beliefs, and norms. They are the reasons which makes it easier to adapt to other products from different cultures but hard to change usual behaviors with the product.

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