# IDENTIFICATION OF FUNCTIONALITY AND USABILITY ASPECTS OF TRADITIONAL PAATHRAYA' IN SRI LANKA

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## Abstract

Functionality and usability can be identified as main key factors under the field of Product design. Traditional products have survived for many years in the history of a particular region or culture. In the perspective of product design, traditional products have gone through stages of designing and tested continuously with actual context. Therefore, those traditional products can be identified as well-designed products even though there is no any particular person to identify as a designer for them. Sri Lankan culture is believed to be more connected with the nature and sustainable concept according to social scientists, historians, archaeologists and folklore explorers. `Paathraya` is a traditional identical product that used by Buddhist monks not only in Sri Lanka but in other countries also. Therefore, it has a psychological platform combined with its physical characters. *Paathraya* is known as alms bowl in English, *Patra* in Sanskrit, *Patta* in Pali and *Hatsu* or *Hachi* in Japanese. As Product Designer, researching about traditional *Paatraya* of Sri Lanka gives exposure to the design principles and elements, material identification, product functionality and usability. The Research is carried out as an ethnographic research. Empirical Data is gathered by observing Museum collections and *Paathra*, which are currently used, interviewing archaeologists, Buddhist monks, artisans, potters, designers, scientists, sociologists by experimentation and analysing chronological development of *Paathraya*. Secondary data are collected through books and journals to enhance the functions, interpretation and design theories. Research will be based on lay *Paathraya* to explore the importance of material ,design and its usability. Research Findings are behaviour of the product in tradition and in practise, character, norms and the message it conveys. It was found that *Paathraya* provides knowledge to define functionality and usability with its physical and psychological character.

***Keywords:*** *'Paathraya', Culture and Tradition, Functionality, Usability, Product Design*

## Introduction

Traditional products have survived for many years in the history of a particular region or culture. In the perspective of product design, traditional products have gone through stages of designing and tested continuously with actual context. Therefore, those traditional products can be identified as well-designed products even though there are no designers are identified for those products. Designer Dieter Rams has said that a good design is innovative, making a product useful, aesthetic design, making a product understandable, honest, unobtrusive, long lived, consistent in every detail, environmentally friendly and as little as possible.(*Objectified*, n.d.).Therefore, most of the traditional products can be identified as good designs. When identifying traditional products, *Paathraya* can be identified as an iconic product. Sri Lanka also have a culture, which is in-cooperated and connected with *Paathraya*. Merely without being only a physical product, *Paathraya* is connected to the life style of monks, believes and psychology of people.

Functionality and usability aspects have been main parts of product designing from the beginning of professional product designing. Most of the theories regarding those aspects have been build up taking existing products as examples. However, products, which are much older, may have considered those aspects. With the globalization and industrialization, the countries experience products, which are alien to the culture, tradition and society. (UNESCO, 2018) Those products being alien and not suitable have and will create issues to that context. Therefore, it is important to explore and promote products, which are not alien to that context.

The world is having environmental disasters harming every living being in Earth. After understanding the consequences of harmful products and systems, world is moving towards a greener, eco-friendly and sustainable path. On a vision of making a better world and understanding mistakes through our past, it is very interesting to find out how traditional products have been used or still being used and what present and future product designers can extract from them. Adapting human life styles according to traditional products or adapting traditional products in to present human life style may solve most of the human issues in the present and in the future. Therefore, finding out how functionality and usability aspects are applied on products that have survived through the history, is important.

## Functionality and Usability

There are three elements to concern when concerning a product with interaction. Those are Functionality (Product), Usability (Interaction) and Experience (User Experience). (McNamara & Kirakowski, 2006). Design considerations of different design fields may vary but in a broad view of understanding and analysing them, they all can be understood and categorized.
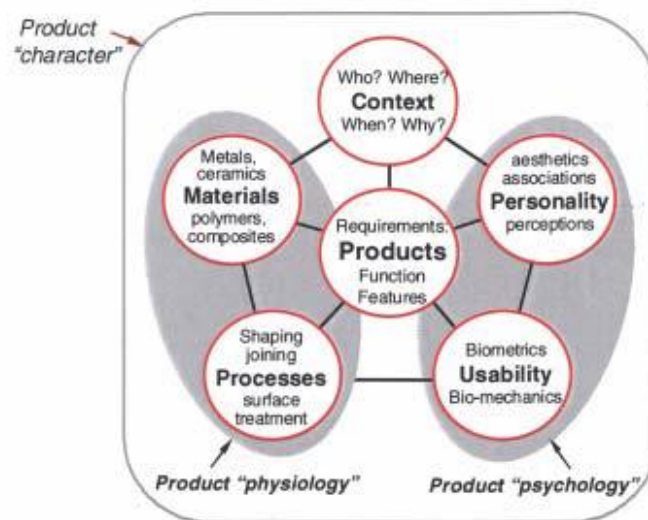


Figure 46-Elements of Products by (Source: Ashby & Johnson, 2003)

Object of Design is the relationship between the user and the product. (BÜRDEK) This enable us to think in a common design procedure view and separate design field views. Designers intention from designing a product, service, interface or any other modes of design outputs, is making it being used by the user ergonomically, in a user-friendly method, giving a pleasure to the user. Designer embed functions in a product, which will be usable to the user. Therefore, it is a relation between designer's intention, contribution and user's expectations.
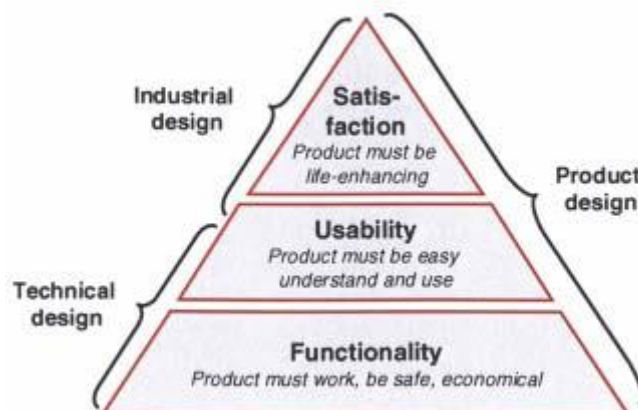


Figure 47- Main Considerations of Designing products (Source: Ashby & Johnson, 2003)

When designing a product, designers follow principles, elements and theories of design. Functionality and Usability can be found among many of those practices. In the paper (Kesteren, Stappers, & Kandachar, 2005) it compare and states the terminologies as stated by several other researchers regarding design elements. Those researchers are globally recognized resource persons regarding design.

| Terminologies | By Roozenburg & Eekels | By Ashby | By Muller | By Ashby and Johnson |
|---|---|---|---|---|
| **Function** | Function | Function | Function | Function, Technical Functionality |
| **Materials** | Physical and Chemical Form | Materials | Materials | Materials (dimensions: engineering, use, environment, aesthetics, personality) |
| **Shape** | Spatial Form | Shape | Shape | Form |
| **Manufacturing Process** | Manufacturing Process | Process | Process/Work | Processes (joining, shaping, finishing) |
| **Use** | Use | - | Use | Use |
| **Product Personality** | - | - | - | Product Personality |

Further they stated that those six elements of design combines with each other to perform special tasks. Accordingly, 'Function' is the aim of the product and the way it operates. The function of a product is the purpose it is made for. 'Use' is the designed interaction the user can have with the product.

Functionality can be defined this way: "The ability of an interface or device to perform according to a specifically defined set of parameters." (Clench, 2013) Supports (Spacey, 2017). A product's functionality enables product to address user needs. For an example, a watches' functions may be Alarm function, World time function, Compass function, Barometer function, Altimeter, Stopwatch function, Thermometer function, Airplane Mode, Tide graph function, Tachymeter, Phone Finder and Pairing. The purpose of using those functions can be varied to each user.

The simplest definition of usability is as follows according to the International Standardization Organization (ISO):"The extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use."

Designers have explained the meaning of usability in different fields of design to cover different dimensions of people interactions with the product. Traditionally, user-centred design has tended to concentrate on usability. Traditional products also have embedded usability as ergonomics, cognitive, emotional, social and cultural aspects.

The differences between functionality and usability can be explained from this statement. 'simple way to think of the difference between functional testing and usability testing is that functional assesses whether or not the product works the way it should, whereas usability addresses whether or not the end user can access those functions and successfully use the product.' (Group, 2018). Most of the product developers explain the difference between Functionality and Usability as "Functionality = the what (features), Usability = The How (interactions)" (Short, 2016). Therefore, it is clear that Functionality and Usability may overlap each other in some occasions but they are two separate concerns under designing.

Reusing is another area, which comes under functionality and usability that reinvent the form and that creation. It is a way of understanding another perception or discovering other ways of that products' usability. Some may be multi-functional in a way of catering for all or some needs. Some products are designed as multi-functional, targeting a reuse, but some are not. User may find another ways to do things or other things to do with it.

Through all these understandings, it will be easy to define Functionality and Usability according to the study. Therefore, Functionality is defined and embedded in to a design by the designers, creators and

artisans of a product. Functionality will guide and show how every element in the product will work and how to use the product. Usability is more connected with the user. Designer may understand what the user actually need or the user may find any solution, which is defined for any other function. Those products will be as a design brief for a designer to create the best suitable design for that purpose. Functionality is how a designer expect a product to be used and Usability is how a product can be used in a number of ways. There are many evidences of unorthodox ways and uses of products. These factors are much important for the development of a product.

## Identification of *Paathraya*

To explore the design elements such as functionality and usability, it is better to analyse a product as a reference. Charles and Ray Eames identified *Lotas* of India as simple, greatest and most beautiful among the objects they encountered on their visit to India. They have given a guideline to follow when designing reference to *Lotas*. (Eames & Eames, 1958) *Lotas* have been attached to the Indian culture and evolve as a perfect product design for that context. Likewise, *Paathraya* can be identified as a good product design. *Paathraya* expresses not only a story about that vessel but also a story of a culture, tradition and a life style. It can be identified as a magnifier, which can be used to get a clear and magnified view of life.

## Use of Design Elements in *Paathraya*

Frequently, natural forms continued to be the ideal model for a particular purpose, with early artefacts made from metal or clay often shaped in forms identical to the natural models from, which they originated. In 1896, in an essay entitled 'Tall Office Building Artistically Considered', the American architect Louis Sullivan wrote: 'It is the pervading law of all things organic, and inorganic, of all things physical and metaphysical, of all things human and all things super-human, of all true manifestations of the head, of the heart, of the soul, that life is recognisable in its expression, that form ever follows function. This is the law.' (Heskett, 2002) It has been explained by taking animals' survival elements as examples. A vessel must be shaped for its purpose. Secondly, the shape must arise naturally from mode of manufacture and exhibit advantages of properties of clay. Thirdly, it should not interfere with its usefulness, appropriate in amount and character to the purpose and material it is made of. Fourthly, it should have a smoothened surface and elaborate refinements. (Coomaraswamy, 1979)

## Manufacturing Process of *Paathraya*

The manufacturing methods of traditional earthenware vessels of Sri Lanka are mostly wheel throwing. Pottery wheel, which used is a hand wheel. It is wheeled by a person (mostly by the wife) and vessels, is formed by another person (mostly by the potter). Other methods, which have been to make pottery, are coil and pinch methods. Most of the vessels are fired at low temperature in a simply packed kiln. The industry has been affected by lack of raw materials, fuel problems and the treat from metallic vessels.

Through the techniques of manufacturing, the artisans have been able to achieve qualities required to the purposes of the vessels.

The main problem with pottery is that it is very fragile. While well-fired clay is virtually indestructible, if bumped or dropped it will shatter. Not only that, but also clay is very useful in keeping rodents and insects out and as it can be set directly into a fire, it is very popular.

## Use of Design Elements to the Product Functionality

The anatomy of a vessel can be separated into three distinct parts: orifice, body and base. Other than the main elements, there may be a neck, collar, spout, lid and handles. In the context of *Paathraya* Orifice, body and base can be identified its main elements.
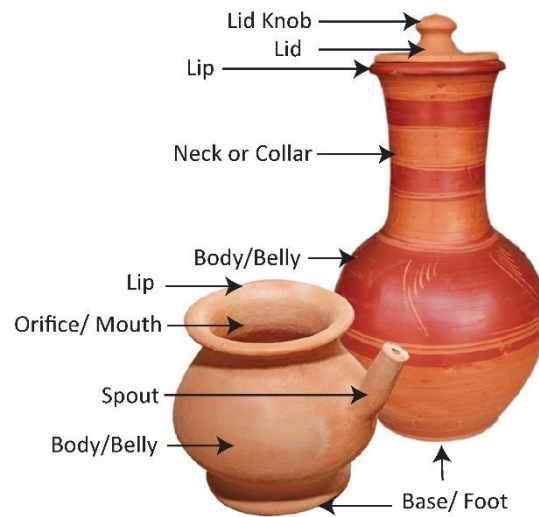
Figure 48- Elements of a vessel (Source: Author)

Orifice- The orifice is mouth of the vessel, and is subject to many different embellishments, mostly for functional use. The main function of the orifice is transferring the substances in and out. Pouring, handling, protecting and  hanging are other functional factors. The opening is further divided into two categories:

Unrestricted: an unrestricted orifice is when; the opening is equal to or greater than the maximum diameter of the body. Restricted: contrarily, is when, the opening is less than the maximum diameter of the body.

Both restricted and unrestricted *Paathra* can be seen.

Body- The body is the area between the orifice (opening) and base (bottom). The maximum diameter of a vessel is usually at the middle of the body or a bit higher. Body is where the substance holding is done. Body is also known as the bell since it made to hold a considerable amount of substances.

Base- The base is the underside of the vessel. It is generally flat or slightly rounded so that it can rest on its own. *Paathraya* does not have a separate base but the underside of the body act as the base of the vessel.

## Findings and Conclusion

'*koppaya*'(cup) – functions of these vessels are basically drinking and eating. It consist of unrestricted orifice and hemispherical body. The lip has been thinned. These vessels have been used to store grave goods as their secondary purpose. '*mandava*' or '*pingaana*'(plate) - these vessels have been used for the eating purposes. They consist of wide and unrestricted orifices. Keeping grave goods has been a secondary purpose of these vessels. '*Paathraya*' (bowl) is primarily for offering food for Sanga. It is a bowl with inverted flat lips, opened or restricted wide orifices and globular body. '*Thatiya*' is a dish with wide orifice, rolled lip and bottom with a foot ring. It has been used to eat food, cook food and cover other vessels.

A single vessel has multiple uses of functions and usability and vice versa. The main function of a single vessel may change through time.
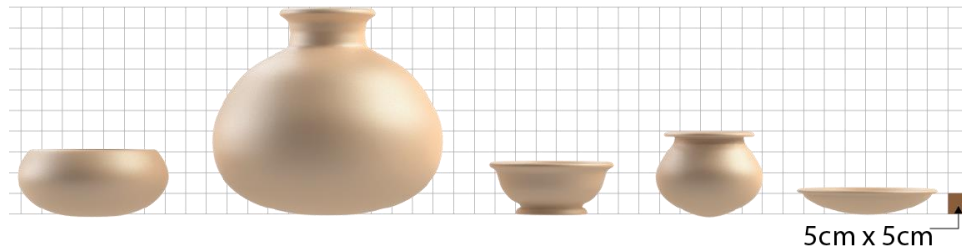
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5cm x 5cm

Figure 49- 'Paathraya, Kalaya, Mati koppaya, Muttiya and Kabala' (Source: Author)

*Paatraya* is a multi-functional product in the possession of Buddhist Monks. It is one of eight essential products ('*Ata Pirikara*') of Monks. '*Ata Pirikara*' are traditionally in Theravada; a bowl; a double robe; an upper robe; a lower robe; a belt (to fix the robe around the waist); a sewing needle – with thread (to mend his robes); a razor (to shave the head and the beard); a water filter (to use water without killing living beings. In '*Vinaya Pitakaya*', it has described what to use as a bowl, how to use it, when to use it and a detailed laws and customs related to the bowl. Iron bowl and Clay bowl are the only accepted bowls. There are three kinds of bowls. They are Large (high), Medium (middle) and Small (low) bowls. In ancient times, Monks have accepted one fourth of the volume of the vessel by uncooked rice. Monks used to live in forests kept all the robes inside the bowl and kept it away from the rain or the small animals like insects and mice. Thickness of the '*Paathraya*' may vary from 2.4mm to 7.4mm. Most of the murals found in Sri Lanka contain drawings of '*Paathra*'.
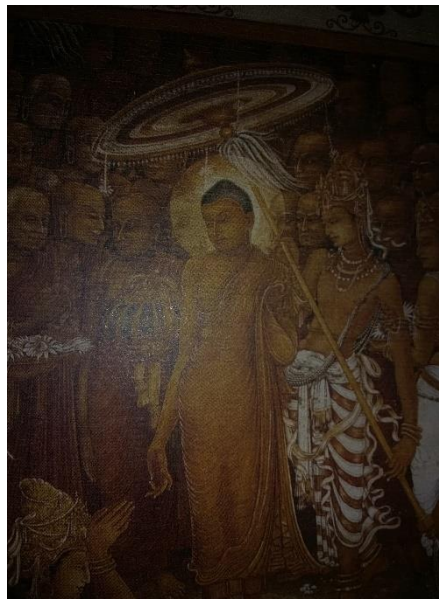


Figure 50- Mural depicting Lord Buddha (Source: Kelani Viharaya)



Figure 51- Lord Buddha with the 'Paathra' (Source: Kelani Viharaya)

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Figure 52- Mural depicting Gods carrying 'Paathras' (Source: Ridee Viharaya)



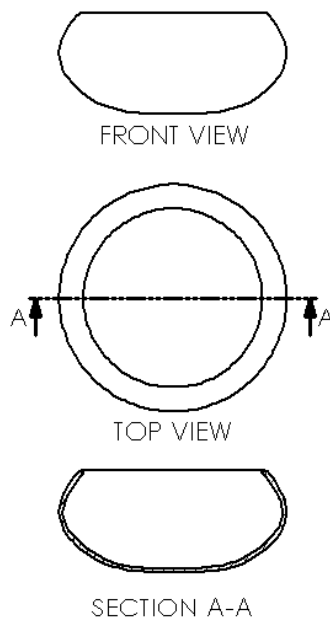FRONT VIEW

TOP VIEW

SECTION A-A

Figure 53- 'Paathraya' (Source: Author)

As Buddhism teaches that 'everything is not forever', *Paathraya* also damages and breaks. 'Kabala' has been a *Paathraya's* reusing stage. After products' wide globular belly has been damaged, as the monks cannot use it as a bowl, 'Kabala' has been built from those. The word meaning of the 'Kabala' is 'old and broken'. It is used to bake '*Roti*', bake spices and to put charcoal and use it as incense burner and a heat source.

Achieving thermal control, reducing weight, making the vessel ergonomically and producing a product that deeply connected to the people, culture and society has been mastered by the artisans or potters. Each vessel consist of enormous knowledge regarding product design with every theories and principles explained.

*Paathraya* shows clear evidences and examples for the definitions of functionality and usability. The qualities of the products have been achieved by the material, shape, form, thickness and usage. All the design theories and principles can be explained through traditional products and more theories and principles can be evolved

A multi propose vessel may be the best approach to a green product due to limited environmental impact with resource extraction, manufacturing, transporting, using and disposing.

The material itself has added a cultural and religious value to the product. The fragility of *Paathraya* intend the user to be more careful and patience. That is exactly the image of monks. The restrictions mentioned in '*Vinaya Pitakaya'* are stated to protect the product as well as the culture it creates. The product is minimalistic as the life should be according to the Buddhism. It is known as '*alpeechchathwaya'* in Sinhala Language.

*Paathraya* is a product, which should be hold with both hands or hold with the support of the body. Therefore offering of a *Paathraya* will be by both hands, which is an accepted behaviour. The orifice of *Paathraya* is covering the content inside, which makes others not to feel greed. *Paathraya* also build up the behaviour of being satisfied with what you have.

*Paathraya* has a globular body with no sharp edges. It makes *Paathraya* easily cleanable and handled. The three sizes of *Paathraya* makes the product ergonomically matching for any user and the quantity of the content is ergonomically designed.

*Vinaya Pitakaya* states that *Paathraya* should not be kept on a chair, bed, edge of out stage, uncleaned floor, even on lap or hanged by a stick. *Pathraya* and Buddhist culture is bonded to each other. Buddhist culture has been formed according to *Paathraya* than vice versa.

*Paathra Thaliya* is the robe used to carry *Paathraya*. It has been developed to hang Paathraya on a shoulder and carry it in front. *Paathraya* is covered by '*Siwura'* (robe) or hand. From a psychological perspective, it makes *Paathraya* prioritized and important. From that, a symbolic meaning is given to the people.



Figure 54- Holding of Paathraya (Source: www.you2repeat.com)

*Paathraya* is a universal product, which meant equality of every human being. Sangamiththa thero has brought 'Sri Maha Bodhiya' to Sri Lanka in a *Paathraya*. *Paathraya* is an icon resembling equality, minimalistic lifestyle and calmness.



Figure 55- A large Paathraya being used in 'Aluth Sahal Mangalyaya' (Source: www.lankatag.com)

Products should not be over designed. The history of *Paathraya* depict that it was and is the most suitable design for centuries of years. Therefore, any changes done to the vessel will be changing of a culture and tradition. If it is essential, it should be done with great care and proper rationale.

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