MULTIFUNCTION SHOE: A CASE OF NEW PRODUCT DEVELOPMENT

Tan Kai Lun, Shahryar Sorooshian*, Syed Radzi Rahamaddulla
Faculty of Industrial Management, Universiti Malaysia Pahang (UMP)
Pahang, Malaysia.
*Corresponding Author

ABSTRACT

The success of the new invention and technology development had set up a chain reaction of research and development in the shoe industry. The design of shoes keeps changing and varied tremendously through time and from culture to culture. The design and appearance of shoes originally being tied to function means that different shoes of design will have different functions for wearing purposes. Innovation on the product is very important for nowadays and it also can be applied to a pair of shoes to bring benefits for people. This study conducted with the purpose to identify the limit function of current house chore cleaning tools and propose a new innovative product which is “Multifunction Changeable House Chore Shoes” that could help to solve current limitation.

Keywords: New Product Development; Innovation; Shoe.


1. INTRODUCTION

The footwear is known as ‘shoes’ is an item that invented to protect and comfort the human foot while people wear it to walk or doing various activities. The success of those invention and technology development had set up a chain reaction of research and development in the shoe industry. The design of shoes keeps changing and varied tremendously through time and from culture to culture. From time to time, the technologies become more advanced and many kinds of creative footwear had been created and existed in the market. Nowadays, innovation is also very crucial to the industry or even society. The introduction of new products is often assumed to have a clear and positive effect on the growth of employment and income [1]. Moreover, innovation has a significant impact on corporation performance by producing an improved market position that brings a competitive edge and outstanding performance [2].
Customers or buyers expect the innovation is based on the “solutions” approach means that their need is not a good or product but a solution for their problem in life, giving calmness and meeting the need for safety [3]. People just implemented simple technology on one of the product and could bring a lot of convenient to them. For the household, people also invented house slippers and wear it to avoid foot contact with the dust on the floor. Talking about the household, while people are doing house chores, how a pair of shoes can be created and innovated to bring conveniently and solve the problem for them. Hence, based on the situation, a new product is proposed: “Multifunction Changeable House Chore Shoes” and study how this pair of slippers can help the people in doing house chores.

House chores became a normal daily light work of a household to make sure the cleanliness of a house. Example of house chores are mopping the floor, brush the toilet, swiping the floor and so forth. Men, women or even children also need to contribute to doing house chores nowadays. On the other side, in this modern era, the more advanced the technology, the more of the laziness of human being [4]. One of the situation can be seen while people doing the house chores. In the past, most of the people sweep the floor by using a broom, but followed the technology development later, the vacuum machine has been invented to lower the human efforts in cleaning the dust. Thus, people had saved more energy and more efficient in cleaning the dust. With more advanced technology, an automatic vacuum cleaner had been invented which can use the infrared beam to detect walls and obstacles. This machine can roll around the area of the house and clear the dust. Thus, people could save the time and energy without cleaning the floor dust manually. Although these technologies had improved the quality of life of people, there still exist of some problems that need to be considered.

The first problem is people need to bear for the cost. Based on the interview, people afford to pay more for the advanced technology for helping them to do the house chores. Lower income family may unaffordable to pay for the machine. Moreover, each kind of house chores will use a different type of cleaning tools. For example, people need to buy a broom to sweep the floor; people need to buy brushes to brush the toilet floor and toilet bowl; people need to buy the mop for mopping the floor and etc. After that stuff combined together, the costs added up are not a small amount and people tend to pay more for buying the tools. Hence, this significantly increased the budget expenses of the household.

The second problem needs to be considered is the space to keep the cleaning stuff. This is due to the fact that people have to buy a different kind of cleaning tools and consequently, they will face the problem of keeping those stuff or even accumulation of dust and caused hidden allergy to people [5]. In this case, each cleaning tools have their specific function in using for the house chores. For example, people bought the broom to sweep the floor, but it is only one function, thus people cannot use it to clean the toilet bowl. Hence, people need to buy another tool to do another house chore activity. This is not good for the house that has small and limited space as the stuff they bought would occupy the spaces and sometime it will become messy if the tools are too many and do not keep and arrange properly. More worsen, there will be an accumulation of dust and caused an unhealthy environment for the household after a long period.

Based on observation, one more problem is the limit function of the cleaning tools such as broom, brush, and mop. These cleaning tools only perform their own specific function [6]. People had invented a pocket knife with multifunction such as cutting, screwing and even used to open the red wine bottle cap. Hence, this creative and innovative product bring convenient to people as it can be used for many functions in one device rather than spending more money to buy another tool that has limited function. Hence, the cleaning tools nowadays should be created with more economic and creative with multifunction in order to save the
cost, space and convenient to people. So, a new product development: “Multifunction Changeable House Chore Shoes” that implement simple technology concept may help to solve the problem.

Loop Concept” that can help to combine five functions or modes to bring the convenience and lower the effort of people while doing the house chores. The five modes are including: brush mode, mopping mode, wiping mode, dust remover mode and normal mode. The five modes are designed as the base and changeable with the body of the slippers. The body base gets the sticking technology to stick with the different mode bases. So, there are five functions in one pair of slippers.

So, there are five functions of the slippers with five of the different modes. The brush mode can be used to brush the floor of the toilet; mopping mode can use to absorb water on the floor or mop the floor; green brush mode get thinner surface lighter that can be used to brush the dirt on the floor; sticker mode can be used to stick any dust, hair and any tiny objects on the floor and lastly normal mode is the normal slippers base for walking around the house.

Hence, with the five functions in one pair of slippers, “Multifunction Changeable House Chore Shoes” can help to lower the cost or expenses of the consumers. This is because there is no need to buy extra cleaning tools like mop, brush and toilet brush that will cost people more but only can use those five functions in one pair of innovative slippers with simple concept and technology. Besides that, when people no need to buy much of the cleaning tools, it also can help to save a lot of space to keep those tools and avoid the messy situation when the cleaning tools are not arranged and keep the property. It is good for the people who stay at small house or apartment.

Moreover, the slippers can also help to lower the human efforts in doing the house chores. This is because when people wear the slippers to do the house chores, it exerts the force of the whole body to the foot and this can help to lower the effort of people and save a lot of energy while doing the house chores. For example, based on observation, when consumers used the brush mode and wear it to brush the toilet floor, they used the force on the foot to brush; thus, they can save a lot of energy. Apart from that the base of the slippers also can be taken out and clean it when it is dirty. The slippers are also expected to be designed with waterproof. Hence, it really can bring convenience to people as it could save the cost, space, and energy. The size of the slippers also not bulky compared to the cleaning tools with a long stick so it is easy to keep too. Following table 1 is the concept table of “Multifunction Changeable House Chore Shoes”.

<table>
<thead>
<tr>
<th>Type of Mode</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode A: Brush</td>
<td>Effective in brush away and removing dirt on the hard surfaces</td>
</tr>
<tr>
<td>Mode B: Mop</td>
<td>Use to soak up liquid for cleaning the floors and other surfaces</td>
</tr>
<tr>
<td>Mode C: Wiping</td>
<td>Consisting of good water absorbent clothes that used to wipe away dirt and absorb water on the floor</td>
</tr>
<tr>
<td>Mode D: Dust Remover</td>
<td>Used in dry and made with microfiber material that effective in removing dust on the floor</td>
</tr>
<tr>
<td>Mode E: Normal mode</td>
<td>Used to wear to avoid the foot contact with the dusty floor when walking around the house area</td>
</tr>
</tbody>
</table>
2. PROCESS OF MAKING PROTOTYPE

Prototyping is an important stage of product development process. Prototype represented of a design produced before a final solution or product is produced. The prototype presented the product itself to let developer or potential future customers to observe and understand the product. The forming of the prototype is very crucial to figure out the issues as early as possible and also testing the function of prototype before it is launched to the market. The presence of the prototype can also significant to collect feedback from potential customers or users after functional testing. The information or feedback gathered from the users could use to further improve the product in the future and maximize its value. In this chapter, there are several stages to produce the prototype of “Multifunction Changeable House Chore Shoes” as following.

Material selection is an essential stage for making a prototype. At this stage, the researcher surveyed the market, comparing the prices and selects the most suitable materials for making the prototype. A good purchasing planning of raw materials could help to reduce the prices and costs. Besides, some of the materials are taking from the recycle products such as unused cotton clothes and mop. The overall materials are used and prepared as the table 2.

<table>
<thead>
<tr>
<th>Name of Materials</th>
<th>Quantity</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Body part</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC rubber shoes</td>
<td>1 pair</td>
<td>RM 6.00</td>
</tr>
<tr>
<td>Shoes threads</td>
<td>1 roll</td>
<td>RM 0.50</td>
</tr>
<tr>
<td>Base part</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cotton clothes</td>
<td>2 pieces</td>
<td>RM 1.20</td>
</tr>
<tr>
<td>Cloth pieces</td>
<td>4 bundles</td>
<td>RM 2.80</td>
</tr>
<tr>
<td>Scouring pads</td>
<td>6 pieces</td>
<td>RM 1.95</td>
</tr>
<tr>
<td>Microfiber</td>
<td>2 bundles</td>
<td>RM 3.10</td>
</tr>
<tr>
<td>PVC/plastic base</td>
<td>1 pair</td>
<td>RM 2.00</td>
</tr>
<tr>
<td>Hook and loop</td>
<td>1 bundle (1.5m)</td>
<td>RM 6.50</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td><strong>RM 24.05</strong></td>
</tr>
</tbody>
</table>

After all the raw materials needed for producing prototype are prepared, next step is developing the main body part of “Multifunction Changeable House Chore Shoes”. The shoes used are the PVC rubber shoes that purchased from the market. The base of the body part of shoes is designed and sewed with a few of hook strips with threads. Before the base of shoes sewed with the hook strips, the length of hook strips is measured and cut according to the width of the base to make sure they fixed to the base and to maximize the contact between the hook and the loops. After the body part of shoes is done, next step proceeds to develop the base mode of the “Multifunction Changeable House Chore Shoes”. There is five mode with different functions developed which are wiping mode, brush mode, normal mop mode, dust remover mode and mopping mode. The top surfaces of each mode are sewed with the hairy loop strips in order to attach with the hooks of the base part of shoes. The “Hooks and Loops” concept enabled the base part of shoes easily attached and changeable with different type and function of base modes. The five-mode of the base with different function is designed and produced as follows.

Normal Mode: The materials used for the normal mode is a thermoplastic elastomer (TPE). The top surface of the layer is stick and sewed with a few of loop strips while the lower surface is sewed with a layer of the plastic net to give contact with the floor in order to prevent slip away when walking. All the sewing processes are done by using a sewing machine. The normal mode is used for house or office wear to prevent the foot contact with the dust on the floor.
Brush Mode: The brush mode is made from the scouring pads combined with a pair of waterproof bases. The bases are measured and cut according to the shape of the shoes. Next, four pieces of scouring pad that made from steel wool are measured and cut according to the shape of waterproof bases. Then, the cut scouring pads stick with both of the bases by using super glue. The lower surface of bases sticks with scouring pads while the top surface sticks with a few of loop strips which stronghold with the surface by super glue. The function of brush mode is to brush away and removing dirt on the hard surface.

Wiping Mode: The wiping mode is designed and made for wipe away the dirt and absorb water on the floor. The materials used for making the wiping mode are the recycled cotton clothes with good adsorption of water and a pair of washable bases. The two pieces of cotton clothes are measured and cut into the shape according to the size of the bases. After measurement and cutting process, both cotton clothes are sewed under the surface of the bases by using sewing machine respectively.

Dust Remover Mode: The materials used for dust remover mode are two pieces of “hairy” microfiber clothes and a pair of washable pads. The pads are taken from the recycled domestic slippers. Two pieces of microfiber clothes are sewed under both surfaces of washable pads respectively by using a sewing machine. The top surface of both pads is hairy and easily attached or detaches with the loop strips of shoe base. The benefit of the dust remover mode is washable by the washing machine and its function used to remove the dust from the floor and other surfaces.

Mopping Mode: The fifth mode of the “Multifunction Changeable House Chore Shoes” is a mopping mode that used to soak up liquid for mopping and cleaning the floors. The materials used to make the mopping mode are the cloth pieces with good water absorption that took from the recycled mop and two pieces of khaki clothes. The two pieces of clothes are measured and cut according to the size of the shoe bases. Both lower surfaces of khaki clothes are sewed with many pieces of cloth pieces while top surface sewed with a few of loop strips. One of the advantages of this mode is easy to dry and wash by the washing machine. It brings convenience for users while doing house chore activities.

After all modes of “Multifunction Changeable House Chore Shoes” are done, the final step in the process of making prototype is a modification, enhancement and testing the prototype. Developer carried out design or style modification of the prototype to further improve its visual characteristics since a buyer’s purchase decision is influenced by how the product look, feels and functions. A design modification may give a definite impact on the product. After modification and enhancement of the design of the prototype, the developer proceeds to test the prototype whether it is applicable to the real house places. Besides, developer tests the firmness of hooks and loops when the base of the shoe attached and detached with the five different of modes to make sure the prototype is workable. The appearance of all the modes and shoes or prototype is shown in figure 1.
5. MARKET STUDY

Qualitative research is characterized by its aims to market study of the new product, which relate to understanding some aspect of social life, and its methods which generate words, rather than numbers, as data for analysis [7]. The qualitative research is that the researchers are going to gather information from conservation as well as interviews with related people in the research, whereby information will be collected directly from the voice of the respondent. In this study, the method of observation, personal experience and interview will be used for the qualitative research. According to Hill [8], in most of the experimental research, samples of 30 or more are recommended and effective in data collection. The minimum sample size for the interview for the market study is set at 30, however, the more population size for the information, the more information will be gathered. The sampling people for the interview usually provide the information that is useful for the decision making almost every market study.

Housewife is the targeted sample members which are selected to participate in the interview section. According to Statistics [9], women overall spent an average of two hours and 13 minutes of chores daily, compared with one hour and 21 minutes for men in 2013. This means that housewife plays an important role in doing the house chores in order to maintain the cleanliness of the house the method used for selecting the sample for an interview is “non-random sampling” method. This method does not require a sampling frame and often used for quick and convenience purpose. The type of non-random sampling used is called “Convenience or Accessibility Sampling”. The samples are selected because they are accessible to the researcher and this method involves asking a sample of people especially housewife to respond to a face-to-face market survey. Most of the respondents are selected and invited to participate the interview session through recommendation by researcher friends, relatives or even neighborhood. This technique considered cheapest, easiest and least time-consuming.

40 housewives participate in the interview section. There are some of the findings obtained from the data and information gathered during interview section. Based on the pie chart above, for the question of what problems and limitation they faced while using the current cleaning tools in the market such as normal mop, brush, and broom, it is found out that 70% of the housewives stated that there is limit function and only one function of the current cleaning tools. While 17% of housewives stated that the current cleaning tools which stored at the house occupied the space; 5% stated that it is costly to buy any type of cleaning tools to do the house chores and 8% of housewives stated other problems such as causing the
unhygienic condition. For the question about whether the new product which is “Multifunction Changeable House Chore Shoes” could help and solve the current limitation, 100% of the housewives stated that the new product could solve the current limitation. While asking the question about whether those housewives get experienced, notice or using this new product before, there are 100% of housewives stated never experience and notice the new product in the market. Besides, 100% of housewives agreed that the new product is useful and applicable to doing the house chore activities.

For the question about what are the advantages of using this new product, 55% of housewives stated that the new product could reduce human effort in doing house chore activities. Moreover, 18% of housewives stated that the new product could save space; 10% of housewives mentioned that the new product could save time in doing house chore activities; 7% housewives stated that the multifunction of new product could save money while 5% of housewives stated that the new product gives a more hygienic condition and other advantages such as it is multifunction respectively. To compare the new product and current cleaning tools found on the market, there are 100% housewives stated that the new product is better. Last but not least, for asking about what is the reasonable price for those housewives willing to pay to buy the new product, 35% of them stated RM20 to RM25; 28% stated RM25 to RM30; 27% stated RM15 to RM20 while 5% of housewives stated willing to buy at the price at RM10 to RM15 and RM30 to RM35 respectively.

6. CONCLUSION

Technologies become more advanced from year to year, hence, innovative and creative in producing a product is very crucial for a new product to be survived and launched successfully in a competitive market. The innovative product is very important to improve the quality life of people. This study is about how a new innovative product which is “Multifunction Changeable House Chore Shoes” could solve the problem in the daily life especially for those housewives in doing house chore activities. Based on the study and observation, the problems such as the limited function of current cleaning tools, occupied space to store the cleaning tools, spend money to buy a different kind of cleaning tools or even caused unhygienic condition while storing the cleaning tools are currently faced by the housewives. Hence, the objective of this study is to investigate the limit function of current house chore cleaning tools and to produce a new innovative prototype which is “Multifunction Changeable House Chore Shoes” that could help to solve current limitations. The prototype will be tested for the potential market satisfaction. The prototype is the shoes that can perform five different tasks with changeable shoe bases that known as a mode which is wiping mode, brush mode, normal mop mode, dust remover mode and moping mode. The modes are attachable and detachable with the shoe body by using nylon hook and loop concept. 40 housewives are participated in interview section for the market study, based on the data and information gathered, “Multifunction Changeable House Chore Shoes” is fresh and new to the market and all the interviewees never experience or notice the product similar with the prototype in the market before. It is concluded that the new prototype brings significant function that could solve the problems of housewives in doing house chore activities. Most of the interviewees give positive expression and comments to the new product. It is indicated that the new product has the potential to be launched and accept by the consumers in the future market as the data analysis show the positive results.

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