

DBC212 Innovation & Change

A Report on the Innovation of the SMART shoe rack

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Abstract

The purpose of this report is to present an innovative product that solves current issues of the high chance of COVID-19 virus and harmful bacteria and germs on people's footwears after returning from outside. The team developed an innovative product named SMART shoe rack. In a single shoe rack, the product will create a germ-free environment for shoes. The three stages of the Innovation Value Chain—known as Idea Generation, Idea Conversion, and Idea Diffusion—are involved in the development of ideas. For the SMART shoe rack to be successfully introduced to the market, the team proposed the concept of the innovative product to their classmates in return for feedback which was collected in a form. After receiving feedback, the suggestions obtained will be used to modify the product and enhance its features. The SMART shoe rack featured a diffuser to give fragrance shoes by diffusing essential oils inside the shoe rack. The product also came with a purifier that maintains the air inside the shoe rack clean by filtering out dirty air. Additionally, UV lights will shine on shoes to eliminate any type of viruses, bacteria, and germs. In inventing this product, the team aim to clean and sanitize people's footwear, in a much faster, easier, cleaner, and effective way to prevent illness and preserve cleanliness in homes.

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1.0 Introduction

After considering numerous ideas for innovation, the team opted to pursue the "SMART Shoe Rack" idea for this report. We are focused on the issue of people not washing their footwear because they are unaware of the number of germs and bacteria it might bring into their home. Many individuals are still unaware of how vital it is to clean their footwear on a regular basis to preserve cleanliness and prevent illness in the home. This invention was inspired by the desire to discover a solution for people who do not have time or are too lazy to clean their shoes on a regular basis and still wear them outside even though they stench. Our market will be aimed at parents (generation Y and X), particularly housewives, shoe collectors, nursery, child center, and general households, and people with greater income.

1.1 Background and Purpose of the Innovation

It is a routine for everyone to leave their homes wearing various sorts of footwear, such as sandals or shoes. Everyone have their own method and the need of keeping their home clean and free of illness. However, one thing they are ignorant of is the germs and bacteria they brought in on their footwear after returning from outside. It is an important problem during this COVID-19 era that there is a chance of virus on our footwear. As stated in Crist (2020), half of an ICU's staff's shoes tested positive for coronavirus, and the floor of the hospital pharmacy where staff had walked had a 100% positivity rate, even though no patients were there.

In 2016, researchers at the University of Arizona conducted a shoe study on a random sample of participants (Gallant 2016). They concluded that shoes spread more viruses than toilets and identified 440,000 units of bacteria on a single pair of shoes in a two-week period, as seen in the figure below. Furthermore, they discovered that when these germs are carried inside the house, they move to clean surfaces almost 90% of the time (FootFitter 2018).

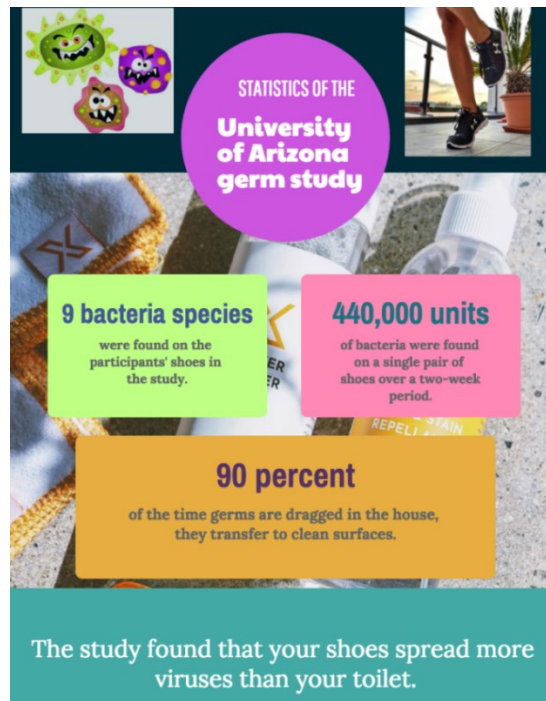


Figure 1: Bacteria found on shoes (University of Arizona 2016).

A further study conducted by the University of Arizona discovered that among the disease-causing bacteria found on many shoes were *Klebsiella pneumoniae*, *Serratia ficaria*, MSRA, and c-diff which could cause infections in the wounds, respiratory, bloodstream and pneumonia (Scalzo maintenance 2022).



Figure 2: 90% bacteria found on shoes (University of Utah 2015).

Cindy Gellner, MD concurred that 90% of bacteria comes from shoes, including *Escherichia coli*, which can cause intestinal and urinary tract infections, meningitis, and diarrheal disease (FootFitter2018).

We believed that the team should find a solution to this issue based on facts and studies that germs and bacteria are mostly found on shoes and can cause to serious illness spread in homes, especially in the COVID era. The team resolved to fix the problem by employing sophisticated technology in the form of easier, faster, and cleaner of cleaning footwear. We discover that UV lights are effective in killing germs, and that an air purifier system filters the air and removes pollutants such as dust, bacteria, and viruses. Moreover, we discover the need for a diffuser to keep everyone's footwear aromatic by allowing the fragrance from essential oils to persist for weeks and months. These three components of technology are very suited to solve the issue. Hence, we developed an innovative idea of combining all components into a single system in a shoe rack named “SMART Shoe Rack,” perfect and ideal for every home.

2.0 Idea Generation

The first phase of the innovation value chain involves coming up with and listing either new or existing ideas to improve. As explained by McConnell (2019), brainstorming is a group creativity process that is frequently used to solve a specific problem by freely gathering fresh ideas from team members. Brainstorming focused on the session's 'objective;' hence, the objective of this report is to make people's lives easier by enhancing household functions using advanced technology. During this phase, two team members use brainstorming techniques to come up with innovative ideas. There are more external ideas than in house ideas listed. The ideas generated by the team are listed in the table below:

No.	Idea	Description/ brief explanation
1	Alarm doormat	A doormat that serves as an alarm and must be stepped on to stop. Using a Bluetooth-controlled app, it will display the current digital time, the user's BMI, calories consumed each day, and food suggestions for the day based on the BMI displayed in the app. Made of silky flannel and pillowy memory foam that repels water and is anti-slip to prevent it from sliding.
2	Automatic curtain	The app controls the opening and shutting of the

		curtain. The user will be able to set when it should close and open, or it will be prompted by an alarm sound in the morning. The user can also choose which side to open: left, right, or middle.
3	Bladeless ceiling fan	An app controls the speed and air quality of a bladeless ceiling fan with an air purifier system that can kill microorganisms in the air. A speaker is included for listening to music or watching movies on TV for a louder sound.
4	Refrigeratoven	App-controlled oven that also functions as a refrigerator. It enables users to operate the device via an app through internet connection. Place food inside 'refrigerator' in the morning, turn on the 'oven' via app, and return home with a cooked supper. Changing the heat, temperature, and timer, as well as informing the user whether the meal is cooked and ready are shown in the app.
5	Smart shoe rack	Shoe rack with circulation and aromatherapy system to keep shoes fresh and free from stench. UV lights are also used to destroy germs and bacteria. Users can put essential oil to diffuser placed inside the shoe rack. Made from high-quality of wood.
6	Solar panels umbrella	This umbrella has solar panels that convert the heat of the sun into energy that may be utilized to power the fan beneath the umbrella. This umbrella contains a USB connector for charging user's phone.
7	App controlled bathtub	Bathtub that is controlled by an app. Cycles for filling the bathtub, water temperature, lights around the bathtub, how much to fill, and displaying the current temperature via app. It also has speakers for relaxing, much like a spa.
8	Flightbulb	2 in 1 light bulb and flashlight. Allowing users to control light bulbs from phone app and labeling each

		bulb for different areas of the house. Control and set on/off cycles, adjust brightness, comes with speakers and various color collection lights, or switch to UV LIGHTS to remove infectious air particles. There is no need to go to switches anymore. It can also use as a flashlight (shape of light bulb) with an on and off switch button, can be carried anywhere.
9	AI washing machine	An app will display everything that happens in the washing machine. Controlling the speed, receiving alerts when the load is complete via the smartphone, starting and stopping, scheduling another cycle, and alerting when the washing machine is in difficulty or requires repair using artificial intelligence.
10	2 in 1 vacuum cleaner	Vacuum cleaner that can switch between mopping and vacuuming modes. Connects to a smartphone via an app that allows you to choose which room or area to clean equipped with camera.
11	2 in 1 coffee & tea maker	This machine can prepare coffee and tea at the same time.
12	New gen bed 2000	A message bed, functions like massage chair that can massage the user before or during sleeping. This bed includes a pillow that allows the user to adjust the softness according to user's head, allowing the body to relax. The message bed and pillows are controlled by a remote.
13	Magic apron	This apron has a lot of pockets and is both fireproof and waterproof.
14	Magnetic key holder	A magnetic key holder, which is a shelf that holds keys with the help of a magnet preventing it from falling down and lost.
15	Smart refrigerator	A screen installed on the refrigerator door can track in and out groceries while also warning you if they are out of stock. The user can directly order from the

		screen's online shop. Through the app, the user can regulate the degree, circulation, and detect any problems with the refrigerator machine or system.
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Table 1: List of ideas

3.0 Idea conversion

The second phase of innovation value chain guide the team to select ideas using a systematic approach rather than personally biased opinion. Taghizadeh et al. (2014, p.534) identified that the conversion involves knowledge transformation to develop innovation that may include the use of multi-skill teams in the process of building innovations.

3.1 Idea Selection

Idea selection is the first step of idea conversion involving screening ideas based on predetermined criteria, selecting most potential ideas, and securing initial development funding. Here, all our ideas are sorted and vetted until just one remains. Our team must decide which product has the biggest chance of becoming our final product. The team used three of the five techniques given: Item-by-item, Spend \$100 and PMI (Plus, Minus, Interesting).

3.1.1 Item-by-item technique

In this technique, 15 ideas the team produced will be narrowed down to 7 best ideas. There are three criteria considered to choose the greatest idea with the most ticks: novelty, attractiveness, and feasibility. The concept of novelty assesses how new or creative the idea is. The attractive is determined by its benefits or the extent to which it solves an issue. The feasibility is concerned with how realistic the idea is or how easy it will be to implement in practice. The following are the seven best selected ideas:

No.	Ideas	N (Novel)	A (Attractive)	F (Feasible)
1.	Alarm doormat	✓	✓	✓

2.	Automatic curtain	✓	✗	✗
3.	Bladeless ceiling fan	✓	✓	✓
4.	Refrigeratoven	✗	✓	✗
5.	Smart shoe rack	✓	✓	✓
6.	Solar panels umbrella	✓	✓	✓
7.	App controlled bathtub	✓	✗	✗
8.	Flightbulb	✓	✓	✓
9.	AI washing machine	✗	✓	✓
10.	2 in 1 vacuum cleaner	✗	✓	✓
11.	2 in 1 coffee and tea maker	✓	✓	✓
12.	New gen bed 2000	✓	✓	✓
13.	Magic apron	✗	✗	✓
14.	Magnetic key holder	✗	✓	✓
15.	Smart refrigerator	✗	✗	✓

Table 2: Item-by-item technique

The selected ideas are:

- 1) Alarm doormat
- 2) Bladeless ceiling fan
- 3) Smart shoe rack
- 4) Solar panels umbrella
- 5) Flightbulb
- 6) 2 in 1 coffee and tea maker
- 7) New gen bed 2000

3.1.2 “Spend \$100” technique

“Spend \$100” evaluation technique is commonly used when there are less than ten ideas. The team must now spend an imaginary \$100 divided among seven ideas based on our choices. The team can acquire the top three rankings among the seven ideas listed below with the most money:

No.	Selected idea	Kayla \$	Ria \$	Syuhada \$	Faiyaz \$	Total (\$)	Rank
1.	Alarm doormat	20	25	25	15	85	1
2.	Bladeless ceiling fan	10	20	15	10	55	4
3.	Smart shoe rack	15	20	10	20	65	3
4.	Solar panels umbrella	5	10	5	5	25	7
5.	Flightbulb	30	5	20	25	80	2
6.	2 in 1 coffee and tea maker	15	5	10	10	40	6
7.	New gen bed 2000	5	15	15	15	50	5

Table 3: Spend \$100 Technique

The top three ideas are:

No.	Ideas	Total (\$)	Rank
1.	Alarm doormat	85	1
2.	Flightbulb	80	2
3.	SMART shoe rack	65	3

3.1.3 Plus, Minus, Interesting technique

After narrowing the list of ideas down to three, the team chose to apply the plus, minus, and interesting (PMI) technique to further refine the list. The plus will be the positive aspects of the idea, the minus will be the negative aspects of the idea, and interesting will be those points that are neither good nor bad, but are regarded as neutral observations, points of interest, or thinking about how the idea can be expanded and what it may lead to. The three chosen ideas, together with their PMIs, are listed below, and as an outcome, our team has chosen “SMART shoe rack as our final idea.

Idea: Alarm doormat		
Plus (P)	Minus (M)	Interesting (I)
Can measure and display user’s weight on the doormat and calories count needed through app.	It is costly due to the required technology and the calculation calorie may be inaccurate.	Perhaps the team can program a robot voice to tell the user the weather for the day every morning when the alarm goes off.
Portable, easy to set up and comes with minimalistic design. Allow app control through Bluetooth and show food recommendations via app.	May be heavy because of the components inside. There is no Wi-Fi and only Bluetooth. Battery-powered making it inconvenient and app may malfunction.	It would be interesting to collaborate with Xiaomi’s smart scale 2 to improve additional capabilities of showing body composition (body fat, etc.) in the app.

Table 4: PMI of Alarm doormat

Idea: Flightbulb		
Plus (P)	Minus (M)	Interesting (I)
Allow control of brightness, colors and labelling of individual light bulbs without switch via app connected by Bluetooth and equipped with speaker. Using LED light bulb for	App can take large percentage and drain the battery’s phone and may be difficult to set up if there are many light bulbs to connect to the app. UV lights can create radiation. Cannot be controlled except in home	It would be interesting to collaborate with a house builder of building residence and use this app controlled light bulb for the houses.

long lifespan dan energy efficiency. The ability to remove infectious particles around the house by switching to UV lights.	area within the Bluetooth range.	
Can function as a flashlight with an on/off switch button but also a light bulb that can be carried anywhere by connecting the stick with batteries inside to the light bulb.	When the power goes out at home, the bulb may not be as functional as a standard flashlight, which may shine brighter in the dark.	Perhaps the team can make the bulb charge with power like a phone, eliminating the need for batteries, and make the bulb connect to Wi-Fi, allowing it to be controlled by phone from anywhere.

Table 5: PMI of Flightbulb

Idea: SMART shoe rack		
Plus (P)	Minus (M)	Interesting (I)
Equipped with UV lights that can eliminate germs and bacteria on the shoes. Made of teak wood, which is heat and water resistance.	The shoe rack is heavily reliant on electricity to function. Termites may cause damage to the shoe rack as it is made from wood, which might affect the components inside.	It would be interesting to collaborate with IKEA to combine ideas for improving this innovation, such as making it more minimalistic, contemporary, or modern in design to suit a wider range of home designs and allowing users to customize the size.
It has both purifier and diffuser for essential oils that may be diffused inside the shoe rack to keep shoes odor-free.	The machine may be noisy when we least expect it, which may bother guests visiting the house. Need to handle with care and provide large area to	Perhaps the team can develop an app for both iOS and Android to allow users to control functions by phone and receive alerts

	be placed in the house.	if the machine require repair.
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Table 6: PMI of SMART Shoe Rack

The selected idea is SMART shoe rack

After screening ideas using three techniques, the team opted to pursue the "SMART shoe rack" idea. The SMART shoe rack is intended to clean people's shoes in a much faster, easier, and cleaner way. It uses technological components that can destroy germs, bacteria, dust, and give fragrance to footwear in a single shoe rack, eliminating the need for people to clean their own shoes or go to a shoe cleaner, which takes more time. The diffuser is the first component within the shoe rack. The diffuser will disperse essential oils into the air inside the shoe rack, providing fragrance for the footwear throughout the day and lasting for weeks and months. The second component is the purifier, which uses a fan to filter the air inside the shoe rack to eliminate pollutants such as dust, odors, bacteria, and even viruses. Last component is the UV light known to be highly effective at decontamination since it disrupts the molecular connections that hold viruses and bacteria's DNA together and is effective against all germs.

The team intends to offer it online first to test the market, and if it proves profitable, we may open a physical store so that customers can see the SMART shoe rack before purchasing. We can also explain the features and benefits directly and clearly to them.

3.2 Idea Development

The second step of Phase 2: idea conversion from the Innovation Value Chain involves the team creating a 'prototype' of the SMART shoe rack to better understand how the innovation in the product works. The six serving men technique is used in this step. The team exercise in which a problem is examined from twelve different perspectives. It is based on Rudyard Kipling's words and allows the team to examine the problem and extend the idea by challenging it with the following questions: What, Where, When, How, Why, and Who (Möller 2012). This technique allows the team to see the benefits and drawbacks of the product from several perspectives for future development, greater understanding of the product, and marketing it.

Six Serving Man

The table below answers Rudyard Kipling's words of What, Where, When, How, Why, and Who questions about our product.

Type of information	Answer
<ul style="list-style-type: none"> • What kind of material is used in SMART shoe rack? • What is the difference between SMART shoe rack and other shoe rack? 	<ul style="list-style-type: none"> • The material used in SMART shoe rack is teak wood. • The difference is SMART shoe rack has UV light, diffuser, and purifier.
<ul style="list-style-type: none"> • Where will the SMART shoe rack be sold? • Where can customers service the SMART shoes rack? 	<ul style="list-style-type: none"> • SMART shoe rack will be sold in Malaysia through online platforms. • Customers can contact the service center from our website.
<ul style="list-style-type: none"> • When will SMART shoe rack will be released to the market? • When will the SMART shoe rack be delivered after payment? 	<ul style="list-style-type: none"> • The SMART shoe rack will be released once all processes are completed and stock is available. • Due to product inspection, packaging, and delivery (Postage delivery), the SMART shoe rack will take 5-7 days to reach customers. It may take longer if the customer's home is located distant from our factory.
<ul style="list-style-type: none"> • Why do customers need SMART shoe rack? • Why do people want to buy SMART 	<ul style="list-style-type: none"> • Because SMART shoes rack can kill germs viruses and bacteria on shoes in a faster and easier way. • Because nowadays people live in

shoe rack?	covid-19 era. Customers know that SMART shoe rack can help to prevent the spread of viruses and germs brought by the shoes in the house.
<ul style="list-style-type: none"> • Who are the target customers? • Who can customers contact to claim a warranty? 	<ul style="list-style-type: none"> • Our target customers are upper middle, high, and upper high-class families. Also, parents (generation Y and X), particularly housewives, shoe collectors, nursery, child center, and general households. • Customers can contact our admin through any social media platforms.
<ul style="list-style-type: none"> • How much does the SMART shoes rack cost? • How long is the warranty period for the SMART shoe rack? 	<ul style="list-style-type: none"> • The total cost of the material used in SMART shoes rack is RM 834.68. • SMART shoes rack warranty period is 5 years.

Table 7: Six serving man

3.2.1 Product Design and Features

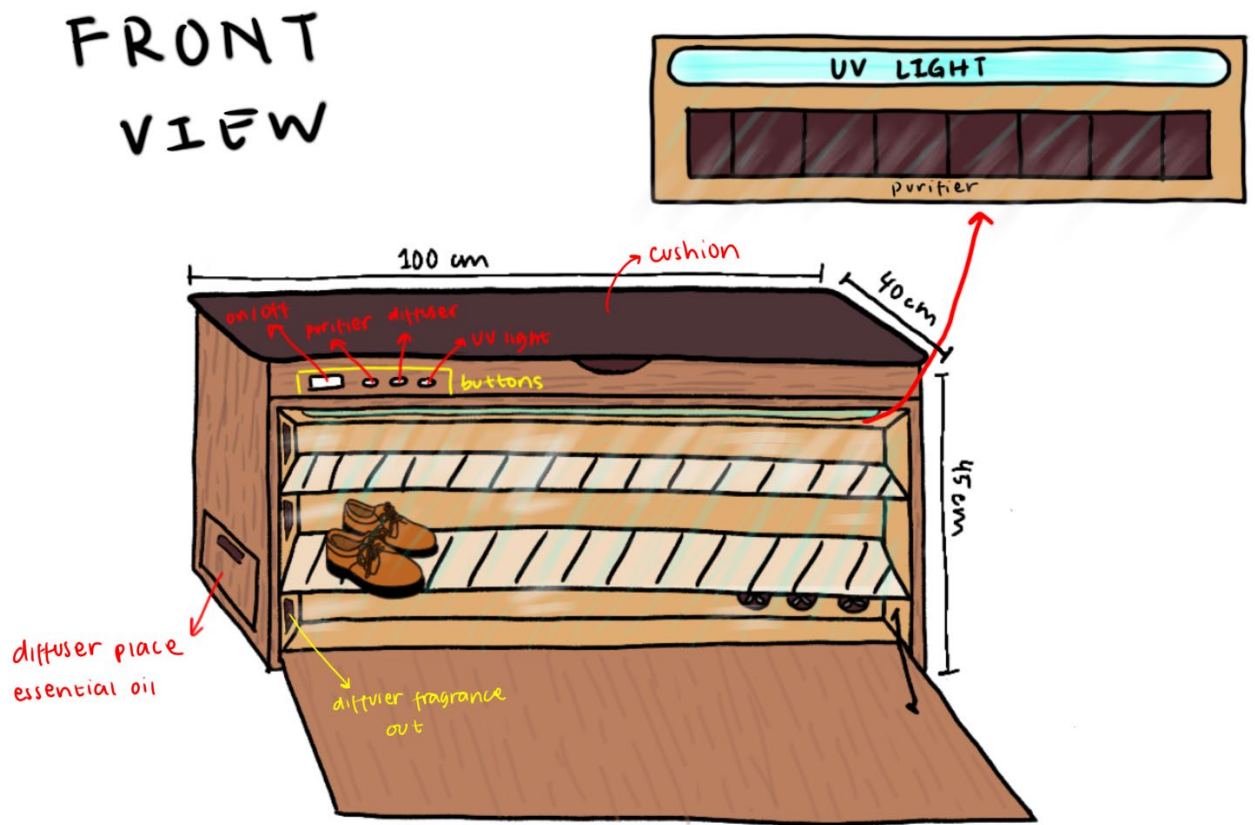


Figure 3: Front view of product

BACK VIEW

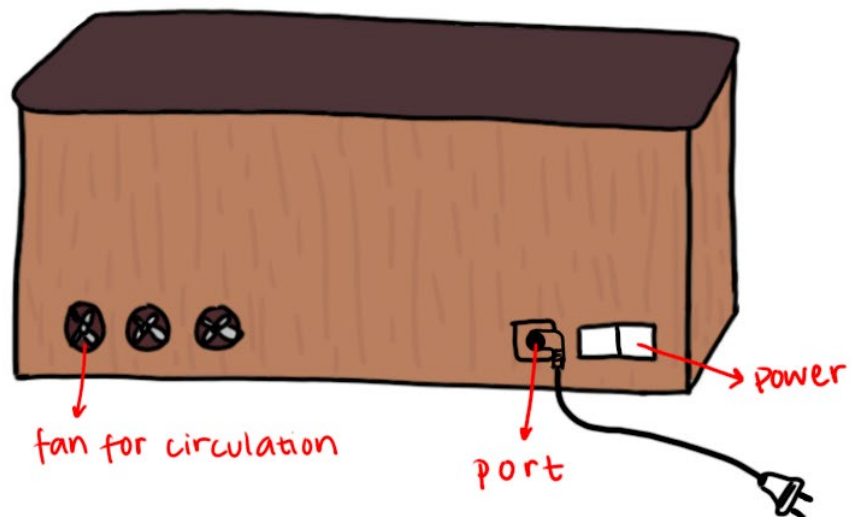


Figure 4: Back view of product

3.2.2 How the Innovation Works

Based on the prototype design shown above, smart shoe rack use power and technology to create a germ-free environment for footwear. It includes three major systems that assist remove harmful pathogens from footwear.

The product has several buttons, ranging from turning it on and off, to selecting between diffuser, purifying, and UV lights. The first step is for users to turn on the SMART shoe rack by pressing the on/off button.

The diffuser is the second step in the sanitizing process, which begins by users pressing the diffuser button and works by releasing the fragrance of essential oils into the shoe rack, which is useful for releasing nice fragrance and removing undesirable odors on shoes from time to time.

The third step is for users to press the purifier button and a purifier located at the top, inside the shoe rack, will start filtering out any unpleasant smells, dusts, pollutants, and germs, which is operated by a fan located at the back of the shoe rack.

The final step is done by pressing the UV light button. The UV light will then shine on all footwear and uses its high-powered energy to neutralize any type of dangerous substance. It is also effective at destroying and deactivating all types of pathogens by disrupting the molecular connections of viruses, bacteria, mold, and fungus on shoes.

Finally, the sanitization process is done. The SMART shoe rack is intended to make it easier for people to clean their shoes more quickly, eliminating any bacteria and viruses that may spread dangerous air in homes. Keeping the house clean and preventing microorganisms that travel via the air is critical during the COVID 19 pandemic.

3.2.4 Materials Used and Cost

The following are the materials required to manufacture the SMART shoe rack:


Materials used	Cost (RM)
Teak wood:	
1. 100cm x 40cm	239.93
2. 40cm x 45cm	119.97
3. 100cm x 40cm	209.94
Diffuser	26.87
Grill plat  (Tokopedia 2021)	59.70
Purifier	80.00
UV Light	22.39

Table 8: Materials required to manufacture the SMART shoe rack

Estimated cost price:

Materials	Total cost
Teak wood	RM 569.84
Diffuser	RM 26.87
Grill plat	RM 59.70
Purifier	RM 80.00
UV Light	RM 22.39
Total cost:	RM 758.80

Table 9: Estimated cost price

Estimated selling price:

Selling Price	RM 834.68
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Table 10: Estimated selling price

4.0 Idea Diffusion

The third step of the innovation value chain involves in introducing the idea to the organization or market. The diffusion of innovation theory, according to Lectera (2021), is a concept that describes how innovations are perceived by society and what regularities that can accelerates their distribution It serves as the foundation for modeling geographical phenomena and developing a system of mathematical functions for determining the sales dynamics of a newly released product. By utilizing the diffusion of innovation theory, the team can forecast which customer segments will purchase the SMART shoe rack. The team can also create effective marketing strategies that will effectively spread acceptance of our product throughout each market segment and estimating the possibility of our new introduction's success or failure (Trinidad 2020).

4.1 Collection and Analysis of Feedback

On Thursday, 23 June 2022, the team has prepared a presentation for our potential investors (the audience), outlining the purpose, objective, features, benefits and constraints, estimated cost and price, target customers, and marketing strategies for the innovative product. Before the presentation began, the team shared a control document for audience to comment on the good, bad, and any improvement that may be made to the product. At 4:00 pm, the meeting formally began with a 20-minute presentation and a 10-minute session for questions and answers. Taking questions for feedback will make the audience feel like they are a part of the team, making the presentation more exciting and engaging (Alifah 2021). This will allow us to learn more about how customers view our products and make improvements by encouraging an exchange of ideas and information.

4.1.1 Collection of Feedback

During the process of obtaining feedback, 19 people shared their views about our product, the SMART shoe rack. To help the team improve the product, each of the 19 responders was requested for feedback on the product's positive, negative, and potential improvements.

4.1.2 Feedback Summary of Positive Comments

No.	Positive Comment (No. of respondents = 19)	frequency
1.	Creating germ free environment and fragrance for shoes	9
2.	Useful and interesting product	5
3.	Good quality and unique product	3
4.	Reasonable shoe capacity	1
5.	Detailed list of costs and materials	1

Table 11: Feedback summary of Positive Comments

4.1.3 Feedback Summary of Negative Comments

No.	Negative Comment (No. of respondents = 19)	frequency
1.	Consume large electricity	4
2.	Limited size	4
3.	Need constant maintenance	3
4.	Requires manual use	2
5.	Product is costly	2
7.	Reduce the price	2

Table 12: Feedback summary of Negative Comments

4.1.4 Feedback Summary of Suggestions for Improvement

No.	Suggestions on improvement (No. of respondents = 19)	frequency
1.	Add on different sizes	11
2.	Automatically turn on when shoes are placed inside the shoe rack	1
3.	Use better components to minimize potential issues	1
4.	Addition of smell remover spray feature	1
5.	Use battery	1

Table 13: Feedback summary of Suggestions for improvement

4.2 Analysis of feedback

After gathering and categorizing the feedback, the team will evaluate the concept based on three criteria: technical feasibility, value adding, and cost feasibility.

4.2.1 Analysis of Good Comments

The team has categorized the good comments to five categories and according to the number of frequency. Based on the information gathered, 'the comment for 'the SMART shoe rack creates a germ-free environment for shoes by sanitizing and giving it fragrance,' rank to be the highest with the frequency of nine. The product's usefulness and interesting features were mentioned the second most frequently with the frequency of five. This is followed by three comments stated that the product is both high-quality and unique because it differs from other shoe racks on the market. One respondent remarked on the product having a reasonable capacity for shoes while one other respondent commented that the team had managed in providing detailed listings of the cost, price and materials used in the product.

4.2.2 Analysis of Bad Comments

1. Consume large electricity.

SMART shoe rack may consume a significant amount of electricity due to its numerous features, including a purifier, diffuser, and UV light, which can only operate with electricity. However, by utilizing the 3 features to eliminate germs, viruses, bacteria, and odors on shoes, the SMART shoe rack ensures that it will produce a germ-free environment for shoes. Therefore, the electricity used in this product will be worthwhile and useful since it will result in clean shoes and a house free of viruses, bacteria, and other germs that are carried within dirty shoes.

2. Limited size.

With the dimensions of the shoe rack, 12 shoes can fit on each tier, making a total of 24 shoes that can be stored in the SMART shoe rack. This amount of space is the maximum possible

given the shoe rack's dimensions. However, this is only the first prototype of the product's design. Therefore, it is possible that the team will modify and create a larger-sized shoe rack in the future so that it can store more shoes.

3. Need constant maintenance.

The product need to have constant maintenance to give the customer a perfect experience. All the essential oils, purifier and diffusers are going to be working all the time to keep the shoe rack sanitized and disinfected and germ free. Hence for the product to work effectively, constant maintenance is needed. The team also decided to offer promotions for the product's maintenance so that customers would not feel their money is being wasted by having to pay for maintenance on a constant basis.

4. Requires manual use.

If the product is automatic, more electricity will be needed. Additionally, it will require more materials, which will raise the cost and pricing. Therefore, the team decided to make the SMART shoe rack manual so that consumers could choose which functions to turn on and switch it on whenever they wanted. Less electricity will be used by the product when it is used manually as opposed to automatically, saving users money instead of having to pay higher electricity bills.

5. Costly.

Due to the high-quality materials used, our SMART shoe rack is costly. To create a durable SMART shoe rack that works flawlessly and is worth to purchase, we must utilize high quality components. Additionally, it offers helpful features that set it apart from other shoe racks available on the market. If we simply use low-quality components, the SMART shoe rack would not provide its full benefits and value. Hence, the team agreed that the consumer will be satisfied, and the features delivered were worthy of the price.

5. Reduce the price

The team thinks that the product’s price is reasonable given the feature it offers, and the profit margin is at bare minimum of 10%. Lowering the price will result in the profit margin falling of the line and may result in the quality of the product falling as the team may have to use cheaper materials and give fewer features to adjust the pricing.

4.2.3 Analysis Comments on Improvements

1. Add on different sizes		
Technical Feasibility	Value Adding	Cost Feasibility
It is technically feasible to expand the shoe rack's size by increasing its height and using more wood.	It adds value to the product because it appeals to shoe collectors and people looking for a larger size of SMART shoe rack for their shoes.	It will raise the price because the team will require more materials to increase its height, but only by a small amount, not more than RM 1000.

Table 14: Add on different sizes

The team agreed on this comment by manufacturing a larger size shoe rack by raising the height and adding more tiers to the current product. The team will consider adding 2 tiers to increase the capacity of the shoe rack. As the size increases, additional wood and UV light will be required. Each tier will have a UV light installed on the side. With this, the capacity for shoe storage can be increased hence meeting the requirement of avid shoe collectors.

2. Automatically turn on when shoes are placed inside the shoe rack		
Technical Feasibility	Value Adding	Cost Feasibility
It is technically feasible to turn on the shoe rack diffuser and purifier when shoes are placed, by including sensors in the shoe rack.	It will add value to the product as more features will be available and customers will not have to turn on the shoe rack by themselves.	It will increase the cost of the product as the team will have to add the sensors throughout the shoe rack. Adding this feature may cost an add up of not more than RM 300.

Table 15: Automatically turn on when shoes are placed inside the shoe rack

The team accepted this improvement and decided to modify the upcoming product to include an automatic sensor. However, as the team need high-quality sensors, costs and prices will increase.

3. Use better components to minimize potential issues		
Technical Feasibility	Value Adding	Cost Feasibility
It is technically feasible to find and replace components of higher quality for the product's improved functionality.	It does add value as the product will perform better and require less maintenance.	It will raise the price of the product because the team will have to replace their current components with better ones which will be more expensive.

Table 16: Use better components to minimize potential issues

The team will consider for future model with this comment of using better components, as the components the team is using are already well tested. There is already enough good, high-quality material in the shoe rack as it is for it to function. Thus, adding better component than current product will be an increase in price for no new feature. Additionally, paying for maintenance will be less expensive than upgrading the components' quality.

4. Addition of smell remover spray feature		
Technical Feasibility	Value Adding	Cost Feasibility
It is technically not feasible to add smell remover spray since it might make the air within the shoe rack damp and wet the shoes.	It does add value as there will be more features in associating to remove odors from shoes.	The cost will increase since the team will have to look for odor-removing spray and do some research on how this feature will operate inside the shoe rack.

Table 17: Addition of smell remover spray feature

The team will consider with this improvement because the diffuser provided in the current model smart shoe rack is sufficient for getting rid of shoe odors and providing long-lasting fragrance.

6. Use battery		
Technical Feasibility	Value Adding	Cost Feasibility
It is technically feasible to change the power of the shoe rack from electricity to battery.	It does add value as users would not have to pay higher electricity bill.	It will raise the cost as the batteries are expensive and will require more component to install them in the shoe rack.

Table 18: Use battery

The team will consider this suggestion for future model because it benefits consumers as they would not incur greater electricity bills because of using the SMART shoe rack. The team will find high-quality batteries that last a long time, ensuring that the product will function properly.

4.2.4 Irrelevant Comments

1. GPS unavailable which is challenging in tracking the product when lost

The team has found three irrelevant comments regarding the product. The comment stated that there is no GPS installed in the product makes it difficult for consumers to find it if it gets lost. This is irrelevant because a shoe rack will be placed inside the home and will not go elsewhere. As the product is considered as a wood furniture, SMART shoe rack is heavy, large, and difficult to move around, making it unlikely that it would ever be stolen or lost. GPS is therefore not at all necessary to be installed in the SMART shoe rack.

2. Limited target customers

Parents from generations Y and X, particularly housewives, are the segment that our SMART shoe rack is targeted toward. Also included are shoe collectors, nurseries, child center, upper middle, high, and upper high-class families, as well as general households. On our list, there are already a lot of potential customers who fall into the Gen X and Gen Y age ranges of 25 to 56, including nurseries, childcare facilities, and three classes of families. General households refer to anyone who comes across SMART shoe rack while looking for household items and is attracted to the product. Given the fact that we have defined 9 target customers for the product, our target customers are not limited.

3. Give time guarantee

The team has clarified that customer will be given a 5-year warranty that they can use claim at any time. This is therefore unnecessary because the clients already have a warranty.

4.3 Modification of Innovation

Based on the analysis of the improvement feedback obtained from control document 3, the team has been given suggestions on what to improve in the SMART shoe rack. The team has decided to the addition of new, larger size to the current product and to build an automatic version of the SMART shoe rack as an improvement.

The team will maintain the shoe rack's length and width of 100cm x 40cm while raising the height from 45cm to 75cm. The improved shoe rack will have 2 additional tiers, for a total of 4 tiers. The team will need to put more UV lighting inside the shoe rack on the right side to ensure that light shines on all the shoes from top to bottom tiers due to the increased size and number of tiers.

Furthermore, there will be additional diffuser openings on the left side to ensure that the fragrance of the essential oil surrounds the entire shoe rack. The team will also add two larger-sized fans to the shoe rack's back side so that the purifier can filter out dirty air more easily and maintain clean air quality inside the rack more effectively, allowing shoes to occasionally stay clean for longer periods of time.

Nevertheless, the shoe rack won't have a cushion because of the increase in size, making it difficult for users to sit on it. Customers can replace the cushion on the shoe rack with any type of home décor to enhance the shoe rack's look.

As the team will require additional wood, UV light, grill plate, and fan for the new, enhanced product, the price of the SMART shoe rack will rise as its size is increased. However, customers will benefit from having more capacity to store their shoes, meeting the requirement of avid shoe collectors.

All the components in the automatic version will be identical to those in the manual version with the addition of sensors inside the shoe rack on the side. The shoe rack will automatically turn on when customers put their shoes inside the shoe rack.

4.3.1 Prototype for manual larger-sized shoe rack

FRONT SIDE

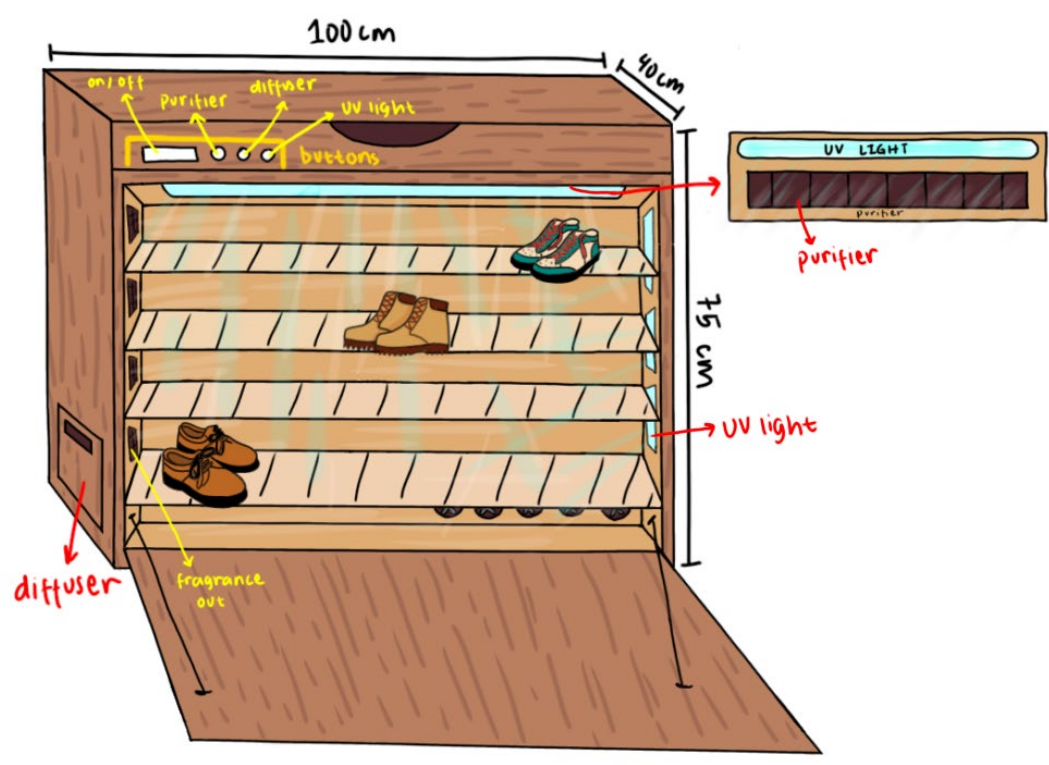


Figure 5: Larger-sized manual shoe rack front view

BACK SIDE

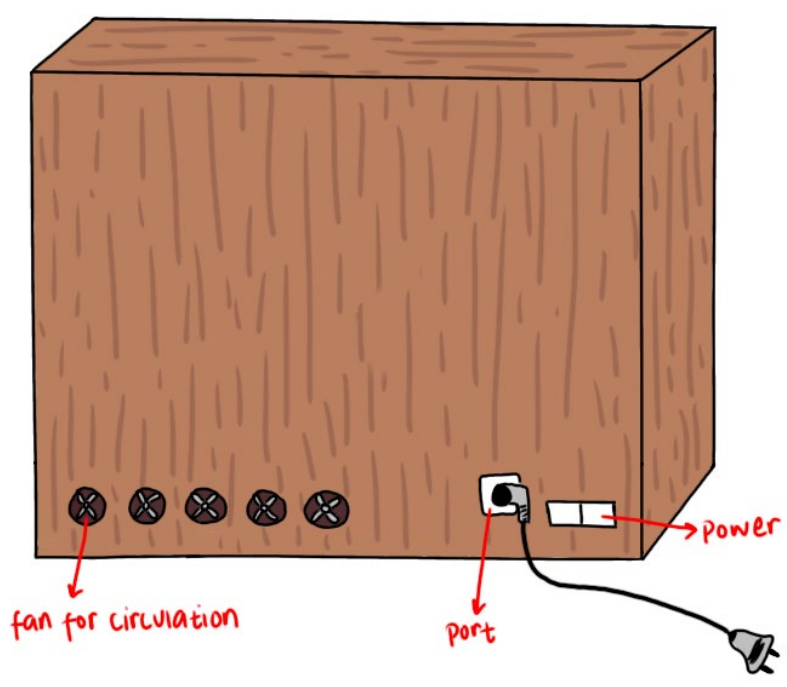


Figure 6: Larger-sized manual shoe rack back view

4.3.2 Prototype for automatic shoe rack

FRONT SIDE

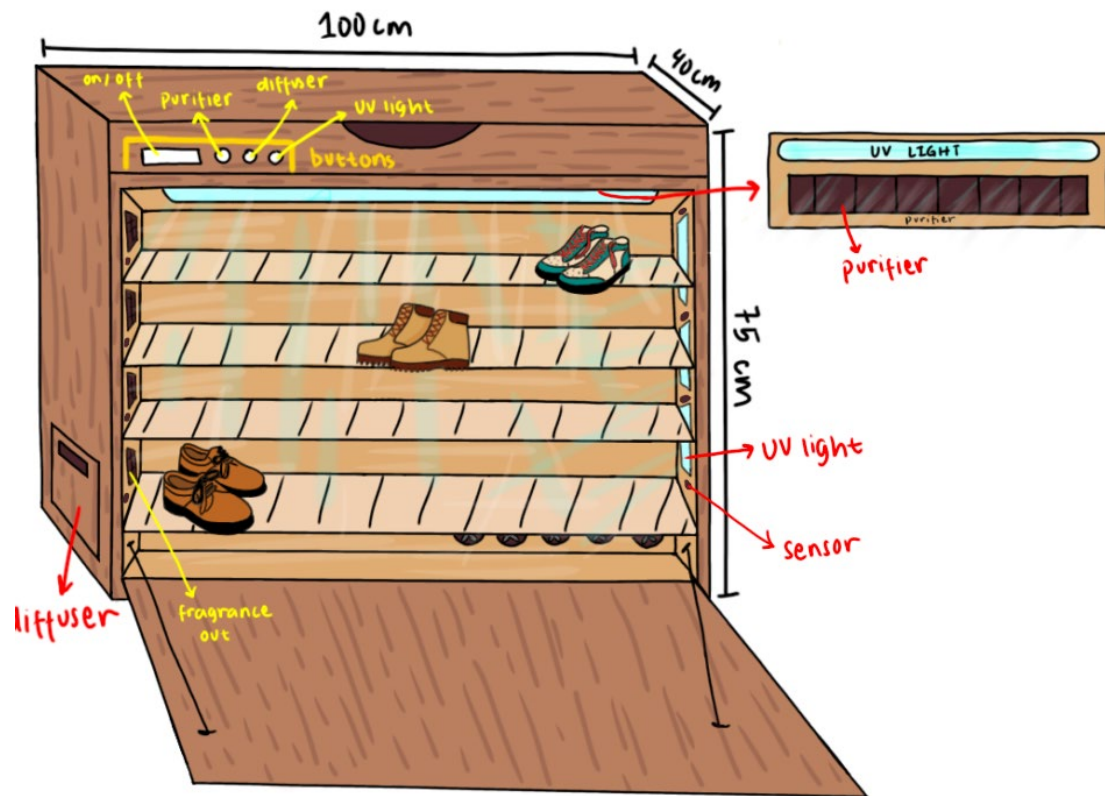


Figure 8: Automatic shoe rack front view

BACK SIDE

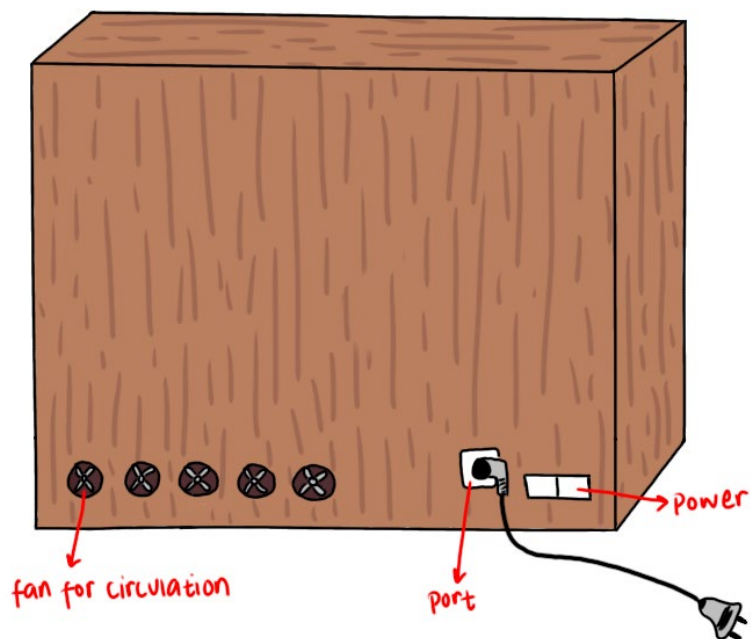


Figure 7: Automatic shoe rack back view

4.4 Promotion Strategies

4.4.1 Social media advertisement

The team will use social media platforms like Facebook, Instagram, YouTube, Twitter, and Tik Tok to advertise the SMART shoe rack. In this approach, the product's attractive content can reach a larger target audience in Malaysia and international market. To maintain contact and engage with customers, the marketing team will frequently publish product-related content in various social media at a specified time. The team will include special offers in our promotion for the launch, such as free shipping and installation for the first 10 customers, as well as 2 free essential oils. Five free essential oils will be given to the following five purchasers. Customers who have purchased the product will still be eligible for special weekly offers of free essential oils. Customers are picked at random, for instance by re-posting our post on their accounts or by participating in our live sale.

4.4.2 Bundle package for essential oil

When customers purchase our essential oils, we offer several packages, one of which is a buy three get one free deal. We also have deals available where customers may buy six and get two free. This marketing strategy will build a sense of urgency in customers, encouraging them to buy. Customers who buy the 12-pack of essential oils receive a discount off the regular price, and each bundle includes a small wooden rack for storing the oils neatly. Customers have the option of choosing any essential oil's scent when making a purchase.

4.4.3 Discount for applying in membership

All customers who apply for membership will receive a voucher worth for 10% discount as part of the most recent promotion. The shoe rack maintenance and the purchase of essential oils are both eligible for this 10% discount. This discount coupon can be used by customers to save money on both the purchase of essential oils and maintenance and repair services. The marketing team will reach out to every customer to invite them to apply for membership. Every time the member card is used, points will be added. On the customer's birthday month, they will get twice the points for each purchase. The accumulated points can then be redeemed for essential oils or discount vouchers offered for maintenance service.

5.0 Conclusion

In conclusion, many people are unaware of the germs and bacteria that can cause serious illness spread in homes are mostly found on shoes. This is an issue in this pandemic as there might be COVID-19 virus on our shoes after returning from outside. Therefore, the team developed an innovative product named SMART shoe rack. The product can remove bad odors and create a germ-free environment for shoes in a single shoe rack. It has a diffuser that disperses essential oils into the air inside the shoe rack, providing fragrance for the footwear, as well as a purifier that filters and keeps the air inside the shoe rack in a good condition. Moreover, it has UV light, which is effective at killing germs, viruses, and bacteria on shoes. The team hopes to assist people in cleaning their shoes in a much faster, easier, and cleaner way. The product may have some limitations, but the team has received feedback and will improve the shoe rack's features in the future.

Furthermore, the team must be aware of its responsibilities to the society, environment, impact of the company's business practices and its commitment to non-profitable aspects. According to the triple bottom line principle, businesses should pledge to provide just as much attention to social and environmental concerns as they do to profits (Kenton 2022). Economic viability refers to the possible profits that SMART shoe rack could earn. The team will control costs, maintain financial stability, and guarantee a return on investment that is more than the overall cost of making the product commercially viable. In terms of social responsibility, the team will evaluate any potential social effects of the SMART shoe rack. The development of the product requires transparency, support for human rights, promote good health, managing of stakeholders, and improvements to worker safety and well-being. Through product testing, the team has ensured that the product is safe to be used by customers. Lastly, environmental sustainability is taking actions that will reduce the impact that SMART shoe rack causes to the environment. To contribute to the long-term sustainability of the planet, the team can reduce packaging material, waste produced, emissions generated, protect resources, and improve transport efficiency in producing the product. The team will use recyclable materials such as recyclable plastic and minimize the usage of plastic in the packaging. Adopting the three bottom line concept will thereby contribute to a more sustainable future, ensuring continuity and long-term value for the business and societies it serves.

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Appendices

Appendix A: Control document 1



Diploma Studies

Swinburne Sarawak

Control Document I

Due: Week 5

Innovation Value Chain Project

Group: Kayla, Ria, Syu, Faiyaz

Results of Brainstorming

Time taken: 5 hours

No. of ideas generated:
[Minimum 15 ideas]

Average No. of ideas generated by each member:

Kayla – 9

Ria - 6

Objective: Enhancing household functions.

List of ideas:

No.	Idea	Description/ brief explanation
1	Alarm doormat	A doormat that serves as an alarm and must be stepped on to stop. Using a Bluetooth-controlled app, it will display the current digital time, the user's BMI, calories consumed each day, and food suggestions for the day based on the BMI displayed in the app. Made of silky flannel and pillowy memory foam that repels water and is anti-slip to prevent it from sliding.
2	Automatic curtain	The app controls the opening and shutting of the curtain. The user will be able to set when it should close and open, or it will be prompted by

		an alarm sound in the morning. The user can also choose which side to open: left, right, or middle.
3	Bladeless ceiling fan	An app controls the speed and air quality of a bladeless ceiling fan with an air purifier system that can kill microorganisms in the air. A speaker is included for listening to music or watching movies on TV for a louder sound.
4	Refrigeratoven	App-controlled oven that also functions as a refrigerator. It enables users to operate the device via an app through internet connection. Place food inside 'refrigerator' in the morning, turn on the 'oven' via app, and return home with a cooked supper. Changing the heat, temperature, and timer, as well as informing the user whether the meal is cooked and ready are shown in the app.
5	Smart shoe rack	Shoe rack with circulation and aromatherapy system to keep shoes fresh and free from stench. UV lights are also used to destroy germs and bacteria. Users can put essential oil to diffuser placed inside the shoe rack. Made from high-quality of wood.
6	Solar panels umbrella	This umbrella has solar panels that convert the heat of the sun into energy that may be utilized to power the fan beneath the umbrella. This umbrella contains a USB connector for charging user's phone.
7	App controlled bathtub	Bathtub that is controlled by an app. Cycles for filling the bathtub, water temperature, lights around the bathtub, how much to fill, and displaying the current temperature via app. It also has speakers for relaxing, much like a spa.
8	Flightbulb	2 in 1 light bulb and flashlight. Allowing users to control light bulbs from phone app and labeling each bulb for different areas of the house. Control and set on/off cycles, adjust brightness, comes with speakers and various color collection lights, or switch to UV LIGHTS to remove infectious air particles. There is no need to go to switches anymore. It can also use as a flashlight (shape of light bulb) with an on and off switch button, can be carried anywhere.
9	AI washing machine	An app will display everything that happens in the washing machine. Controlling the speed, receiving alerts when the load is complete via the smartphone, starting and stopping, scheduling another cycle, and alerting when the washing machine is in difficulty or requires repair using artificial intelligence.
10	2 in 1 vacuum cleaner	Vacuum cleaner that can switch between

		mopping and vacuuming modes. Connects to a smartphone via an app that allows you to choose which room or area to clean equipped with camera.
11	2 in 1 coffee & tea maker	This machine can prepare coffee and tea at the same time.
12	New gen bed 2000	A message bed, functions like massage chair that can massage the user before or during sleeping. This bed includes a pillow that allows the user to adjust the softness according to user's head, allowing the body to relax. The message bed and pillows are controlled by a remote.
13	Magic apron	This apron has a lot of pockets and is both fireproof and waterproof.
14	Magnetic key holder	A magnetic key holder, which is a shelf that holds keys with the help of a magnet preventing it from falling and lost.
15	Smart refrigerator	A screen installed on the refrigerator door can track in and out groceries while also warning you if they are out of stock. The user can directly order from the screen's online shop. Through the app, the user can regulate the degree, circulation, and detect any problems with the refrigerator machine or system.

Appendix B: Control Document 2



Diploma Studies

Swinburne Sarawak

I.V.C	Control
Document	
Due in 2	Week 8

Group: Kayla, Ria, Syurina, Faiyaz

Innovation Value Chain Project

Description of Selection Technique used:

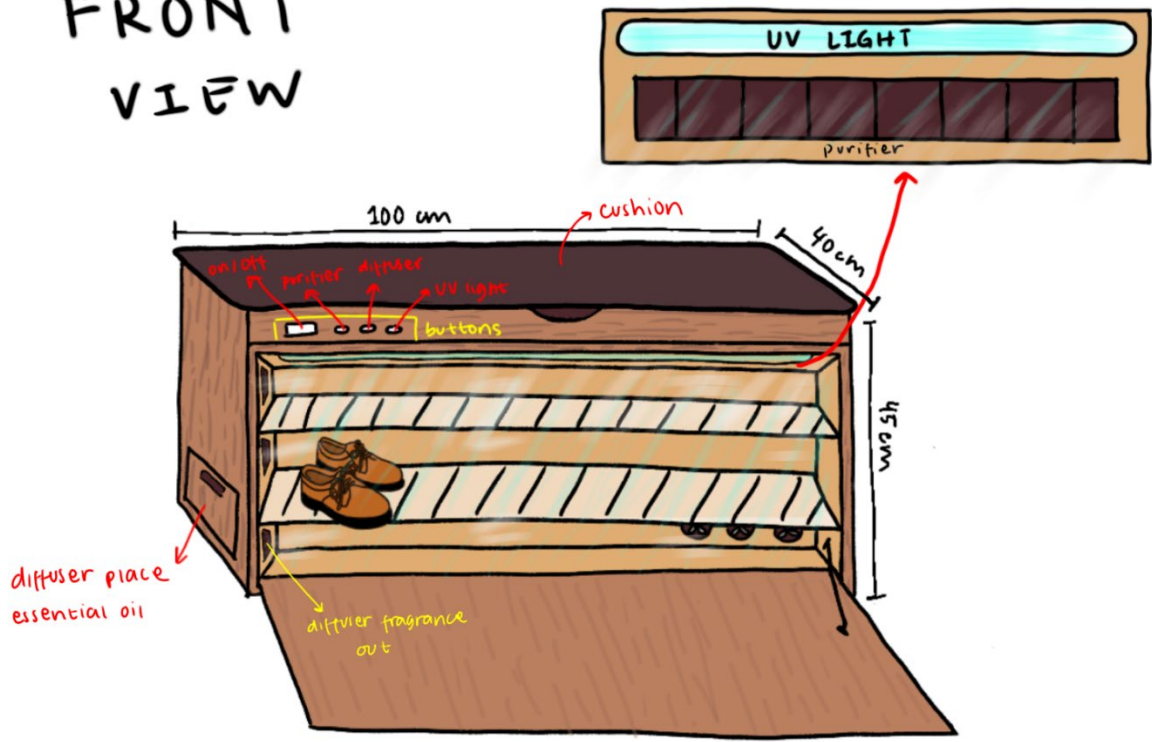
(Minimum 3 techniques)

1. Item by item
2. Spend \$100
3. Plus, Minus, Interesting

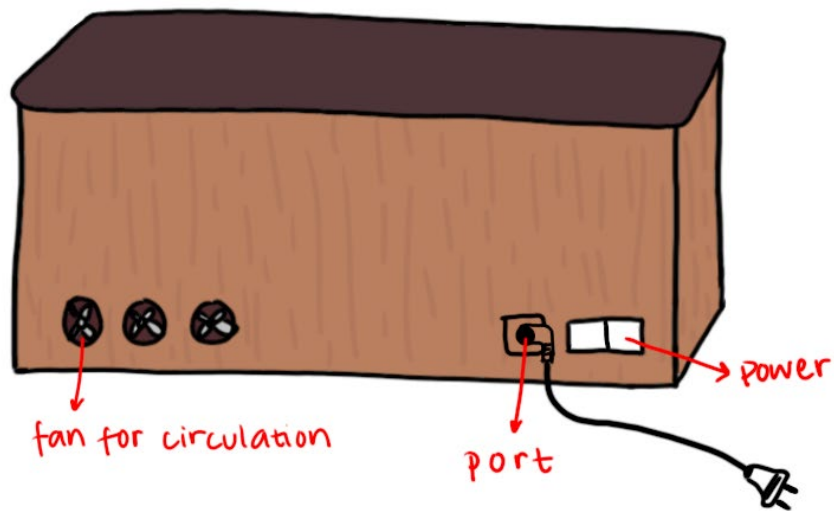
Final Idea selected: SMART shoe rack

Plan for idea development [concept-to-prototype/model]

FRONT VIEW



BACK VIEW



1. Item by item technique

No.	Ideas	N (Novel)	A (Attractive)	F (Feasible)
1.	Alarm doormat	✓	✓	✓
2.	Automatic curtain	✓	✗	✗
3.	Bladeless ceiling fan	✓	✓	✓
4.	Refrigeratoven	✗	✓	✗
5.	Smart shoe rack	✓	✓	✓
6.	Solar panels umbrella	✓	✓	✓
7.	App controlled bathtub	✓	✗	✗
8.	Flightbulb	✓	✓	✓
9.	AI washing machine	✗	✓	✓
10.	2 in 1 vacuum cleaner	✗	✓	✓
11.	2 in 1 coffee and tea maker	✓	✓	✓
12.	New gen bed 2000	✓	✓	✓
13.	Magic apron	✗	✗	✓
14.	Magnetic key holder	✗	✓	✓
15.	Smart refrigerator	✗	✗	✓

SELECTED IDEAS:

1. Alarm doormat
2. Bladeless ceiling fan
3. SMART shoe rack
4. Solar panels umbrella
5. Flightbulb
6. 2 in 1 coffee and tea maker
7. New gen bed 2000

2. Spend \$100 Technique

No.	Selected idea	Kayla \$	Ria \$	Syuhada \$	Faiyaz \$	Total (\$)	Rank
1.	Alarm doormat	20	25	25	15	85	1
2.	Bladeless ceiling fan	10	20	15	10	55	4
3.	Smart shoe rack	15	20	10	20	65	3
4.	Solar panels umbrella	5	10	5	5	25	7
5.	Flightbulb	30	5	20	25	80	2
6.	2 in 1 coffee and tea maker	15	5	10	10	40	6
7.	New gen bed 2000	5	15	15	15	50	5

Top three ideas:

No.	Ideas	Total (\$)	Rank
1.	Alarm doormat	85	1
2.	Flightbulb	80	2
3.	SMART shoe rack	65	3

3. Plus, Minus, Interesting

Idea: Alarm doormat		
Plus (P)	Minus (M)	Interesting (I)
Can measure and display user's weight on the doormat and calories count needed through app.	It is costly due to the required technology and the calculation calorie may be inaccurate.	Perhaps in the future, users will be able to set reminders, and the alarm doormat will remind them by robot voice when they step on it in the morning.

Portable, easy to set up and comes with minimalistic design. Allow app control through Bluetooth and show food recommendations via app.	May be heavy because of the components inside. There is no Wi-Fi and only Bluetooth. Battery-powered making it inconvenient and app may malfunction.	It would be interesting to collaborate with Xiaomi's smart scale 2 to improve additional capabilities of showing body composition (body fat, etc.) in the app.
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Idea: Flightbulb		
Plus (P)	Minus (M)	Interesting (I)
Allow control of brightness, colors and labelling of individual light bulbs without switch via app connected by Bluetooth and equipped with speaker. Using LED light bulb for long lifespan dan energy efficiency. The ability to remove infectious particles around the house by switching to UV lights.	App can take large percentage and drain the battery's phone and may be difficult to set up if there are many light bulbs to connect to the app. UV lights can create radiation. Cannot be controlled except in home area within the Bluetooth range.	It would be interesting to collaborate with a house builder of building residence and use this app controlled light bulb for the houses.
Can function as a flashlight with an on/off switch button but also a light bulb that can be carried anywhere by connecting the stick with batteries inside to the light bulb.	When the power goes out at home, the bulb may not be as functional as a standard flashlight, which may shine brighter in the dark.	Perhaps the team can make the bulb charge with power like a phone, eliminating the need for batteries, and make the bulb connect to Wi-Fi, allowing it to be controlled by phone from anywhere.

Idea: SMART shoe rack		
Plus (P)	Minus (M)	Interesting (I)
Equipped with UV lights	The shoe rack is heavily	It would be interesting to

<p>that can eliminate germs and bacteria on the shoes. Made of teak wood, which is heat and water resistance.</p>	<p>reliant on electricity to function. Termites may cause damage to the shoe rack as it is made from wood, which might affect the components inside.</p>	<p>collaborate with IKEA to combine ideas for improving this innovation, such as making it more minimalistic, contemporary, or modern in design to suit a wider range of home designs and allowing users to customize the size.</p>
<p>It has both purifier and diffuser for essential oils that may be diffused inside the shoe rack to keep shoes odor-free.</p>	<p>The machine may be noisy when we least expect it, which may bother guests visiting the house. Need to handle with care and provide large area to be placed in the house.</p>	<p>Perhaps the team can develop an app for both iOS and Android to allow users to control functions by phone and receive alerts if the machine require repair.</p>

Final selected idea: SMART shoe rack



Diploma Studies

Swinburne Sarawak

Innovation & Change

I.V.C Control Document 3
To be used for evaluation

Innovation Value Chain Project – Post-presentation ‘Feedback’ document

(This document is to be duplicated and one copy is **to be given to each student** in your class to complete and return to you immediately after your presentation. The information obtained is to be used to consider changes that may be made to your idea or product.)

Group: 3 (Kayla, Syuhada, Ria, Fazle)

Name of Innovation: SMART shoe rack

Please state the advantage(s) or **GOOD** thing(s) that you see are associated with this group’s product or idea:

1. **GOOD PRODUCT (ALISA).**
2. **Germ free environment for shoe (Novia).**
3. **Can sterilize our shoes (EDDRICK).**
4. **Good design and include sanitizing function (Swee Yeh).**
5. **Reasonable capacity for sneaker lovers (Calvin).**
6. **Remove bacteria from shoes are very important (Russell).**
7. **Good quality and resistance (Adrian).**
8. **Can sterilize / give nice scent to the shoes (Waleed).**
9. **Come with much interesting and useful feature (Jasmine).**
10. **Stands out from your typical shoe rack as it can sanitize shoes (Ranon).**
11. **It can sanitize our shoes (Joyce).**
12. **Very detail with the price and material used (Xiao Rung).**
13. **It can make the shoes smell nice (Yu Heng).**
14. **Unique product (Munny).**
15. **Removes bad smells and sanitizes footwear (Sanjeev).**

16. **Useful product (Alvin).**
17. **Product features are all very useful and convenient (Amanda).**
18. **Useful (Endny).**
19. **Very useful and kill bacteria (Franco).**

Please state the disadvantage(s) or **BAD** thing(s) that you see are associated with this group's product or idea:

1. **Need to be manually use (EDDRICK).**
2. **The life of UV light is around half year (Novia).**
3. **Will consumes a lot of power energy and cost consumers much money on their electricity bill (Jasmine).**
4. **Comes with only 1 size (Calvin).**
5. **Size is too small for sneakers collectors (Russell).**
6. **Malfunction is frequent (Waleed).**
7. **High price (Swee Yeh).**
8. **Too much electricity consumption (Adrian).**
10. **It will be troublesome if the power goes out (Joyce).**
11. **it is hard for OKU people to use it (Yu Heng).**
12. **Shoe rack will eventually collect dust and need constant wiping (Ranon).**
13. **The target of customers very limited (Xiao Rung).**
15. **Space consuming (Bernard).**
16. **Costly (Munny).**
17. **Can't be used when there is no electricity (Sanjeev).**
18. **Manual usage is required (Alvin).**
19. **Limited size and storage of the product (Amanda).**
20. **Limited size (Endny).**
21. **Size is too big (Franco).**

Please state any **IMPROVEMENT(S)** you could suggest that would make this idea/product better:

- 1. It would be nice if it could turn on automatically when the shoes are put in (EDDRICK).**
- 2. Try to find lower priced materials to lower the price (Novia).**
- 3. Comes with different size varieties (Calvin).**
- 4. Make it with many different sizes (Russell).**
- 5. Use better parts to reduce potential issues (Waleed).**
- 6. Add shoe smell remover spray in the shoe rack (Ranon).**
- 7. Lower the cost to targeting more different stages of customers (Jasmine).**
- 8. Add on different sizes and make the price lower for small size rack (Swee Yeh).**
- 9. Can make the price lower and adjust the size of the product (Joyce).**
- 10. Add on different sizes (Adrian).**
- 11. Try to target different types of customers and comes out with different design and size (Xiao Rung).**
- 12. Should design more different size of the shoe rack (Yu Heng).**
- 13. Should include a battery just in case of the electricity goes out (Bernard).**
- 14. Improve the size (Alisa).**
- 15. Can include guarantee time (Munny).**
- 16. Create more size (Alvin).**
- 17. GPS unavailable which is challenging in tracking the product when lost (Amanda).**
- 18. Add more sizes for the product (Endny).**
- 19. Make it small and after sanitizing store your shoes in another place so that it don't use up so much place (Franco).**

Appendix D: Record of Activities

Record of Activities for Group Project

Group members' names:

1. Kayla ZAHRA - 102762519
2. Ria PAULANDA - 101216824
3. Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL - 102761723
4. Mohammad Fazle Rabbi Faiyaz KHAN - 102760694

Activity	Date	Time	Attendance (Sign)
1. Finding Ideas for control document 1 individually.	May 05th	16:16 PM	Kayla ZAHRA Ria PAULANDA
2. Start doing Control Document 2 Item by Item technique.	May 18th	18:37 PM	Kayla ZAHRA Ria PAULANDA
3. Control Document 2 (\$100 technique).	May 23th	18:16 PM	Kayla ZAHRA Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
4. Control Document 2 (PMI)	May 24th	16:19 PM	Kayla ZAHRA Ria PAULANDA
5. Voting for final selected idea based on PMI.	May 25th	12:48 PM	Kayla ZAHRA Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
6. Prototype drawing.	May 26th	15:00 PM	Kayla ZAHRA
7. Start doing report (1.0 & 1.1).	May 26th	22:37 PM	Kayla ZAHRA
8. Report (2.0).	May 27th	13:38 PM	Kayla ZAHRA
9. Report (3.0 & 3.1).	May 27th	20:14 PM	Kayla ZAHRA
10. Report (3.1, 3.1.1, 3.1.2, 3.1.3, 3.2 & 3.2.1).	May 28th	08:41 AM	Kayla ZAHRA Ria PAULANDA
11. Report (3.2.2 & 3.2.3).	May 29th	13:17 PM	Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
12. Make PPT slides.	June 13th	18:01 PM	Kayla ZAHRA
13. Begin adding information to slides.	June 13th	09:17 AM	Kayla ZAHRA Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
14. Creating script for live presentation.	June 22nd	00:23 AM	Kayla ZAHRA Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
15. Report (4.0, 4.1, 4.1.1, 4.1.2, 4.1.3, 4.1.4, 4.2, 4.2.1, 4.2.4).	June 28th	16:34 PM	Kayla ZAHRA
16. Draw modification of product.	July 03rd	10:15 AM	Kayla ZAHRA
17. Report (4.2.2, 4.2.3).	July 04th	10:20 AM	Dayang Nur Syurina Syuhada BINTI ABANG ZAIDEL Mohammad Fazle Rabbi Faiyaz KHAN
18. Report (4.4).	July 05th	15:19 PM	Kayla ZAHRA

19. Report (5.0)	July 06th	14:40	<i>Kayla</i>
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Appendix E: Record of Contribution to Project Report

DBC212 Contribution to Project Report Writing Form

Contribution to the project report writing [refer to report format] <u>Report sections:</u> [You can list or indicate specifically what you contributed to...]	Student name (s)	Student signature(s)	Date(s)
1. Introduction	Kayla Zahra	<i>Kayla</i>	26/05/2022
2. Phase 1 – Idea Generation	Kayla Zahra	<i>Kayla</i>	27/05/2022
3. Phase 2 – Idea Conversion ○ Idea Selection ○ Idea Development	Kayla Zahra Ria Paulanda Faiyaz Khan Syurina Syuhada	<i>Kayla</i> <i>Ria</i> <i>Faiyaz</i> <i>Syurina</i>	28/05/2022
4. Phase 3 – Idea Diffusion ○ Collection of Feedback ○ Analysis of Feedback ○ Modifications of Innovation ○ Promotion Strategies	Kayla Zahra Ria Paulanda Faiyaz Khan Syurina Syuhada	<i>Kayla</i> <i>Ria</i> <i>Faiyaz</i> <i>Syurina</i>	28/06/2022
5. Conclusion	Kayla Zahra	<i>Kayla</i>	06/07/2022
6. Others: [you can add on to the list below] ○ Table of contents ○ Front page ○ Abstract ○ Bibliography ○ Appendices	Kayla Zahra	<i>Kayla</i>	07/07/2022