



**CREATIONS de UiTM**  
INTERNATIONAL MEGA INNOVATION CARNIVAL **2023**  
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20<sup>th</sup> MAY 2023

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## D-BOX

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### ABSTRACT

D-Box helps individuals who work far from their homes to receive their goods safely. Recently, people are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors. So, by using this product, users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D-Box or not just at their fingertips. All these operations are controlled by Flutter Application, an IoT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box.

**Keywords:** Delivery box; safety; consumer

### INTRODUCTION

#### Background Statement Based on This Innovation Project

Nowadays, the citizen desires a product which will enhance the lifestyle and the product need to be user friendly. People are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors.

#### Problem Statement with Respect to Innovation Project

Problem faced by the people of Malaysia when no one is home. This will however impact towards delivery man and receiver. The absence of parcel recipients at the delivery address during the delivery process can cause many difficulties. Moreover, due to current global pandemic, people are advised to practice social distancing and avoid human contact. This situation will bring some trouble in delivery process. To overcome these problems, we had come out with an idea of enabling a smart, safe, and secured delivery process.

#### Innovation Project and Why This Innovation Project was Carried Out

To solve the problem mentioned to receive a parcel, D-Box is created to solve the problem. D-Box applies high-tech security control system in line with the Industrial Revolution 4.0 (IR 4.0). D-Box is a user-friendly safety box that can be placed in every home. Usage of ESP8266

NodeMCU as the main micro controllers and the usage stepper motor and driver as the door locking system. It also has been assembled with a DHT11 sensor to detect the temperature and humidity as a safety feature. The usage of IoT is also applied in this D-Box. Three out of nine pillars of I.R 4.0 elements has been used in the project. D Box solve the problem of items delivery when the recipient is absent. Consumer goods delivery found that it was difficult for them to be at the delivery address itself due to a variety of factors. People are facing an issue where their parcel is missing because there is no one at the delivery address to pick up the parcel as it is not secured.

### **How Innovation Project Help to Solve the Problem**

This product will cater the difficulty to receive a parcel hence directly solves problems of loss of goods. By using this product, users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D- Box or not just at their fingertips. All these operations are controlled by flutter application, a IoT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box.

### **Methodology of This Innovation Project and How to Use It**

Initially, research was carried out to determine the problems faced by the public. users can unlock and lock the door of D-Box and check whether their item has been successfully placed into D-Box or not just at their fingertips. All these operations are controlled by flutter application, an IoT app that has a user-friendly interface. So, this application can be used by anyone regardless of age. D-Box is super affordable, and it gives a huge impact to the user. By using D-Box, users can focus on what they are doing and should not worry about their parcel anymore. Three out of the nine pillars of the Industrial Revolution 4.0 pillars are implemented in D-Box. From the justification, this product was developed with research questions and research frameworks. The purpose of this research project is to discover answers to questions through the application of D-Box tools.

### **Research Questions**

The main aim of research is to find out the truth which is hidden, and which has not been discovered as yet. Though each research study has its own specific purpose, some general questions of research below:

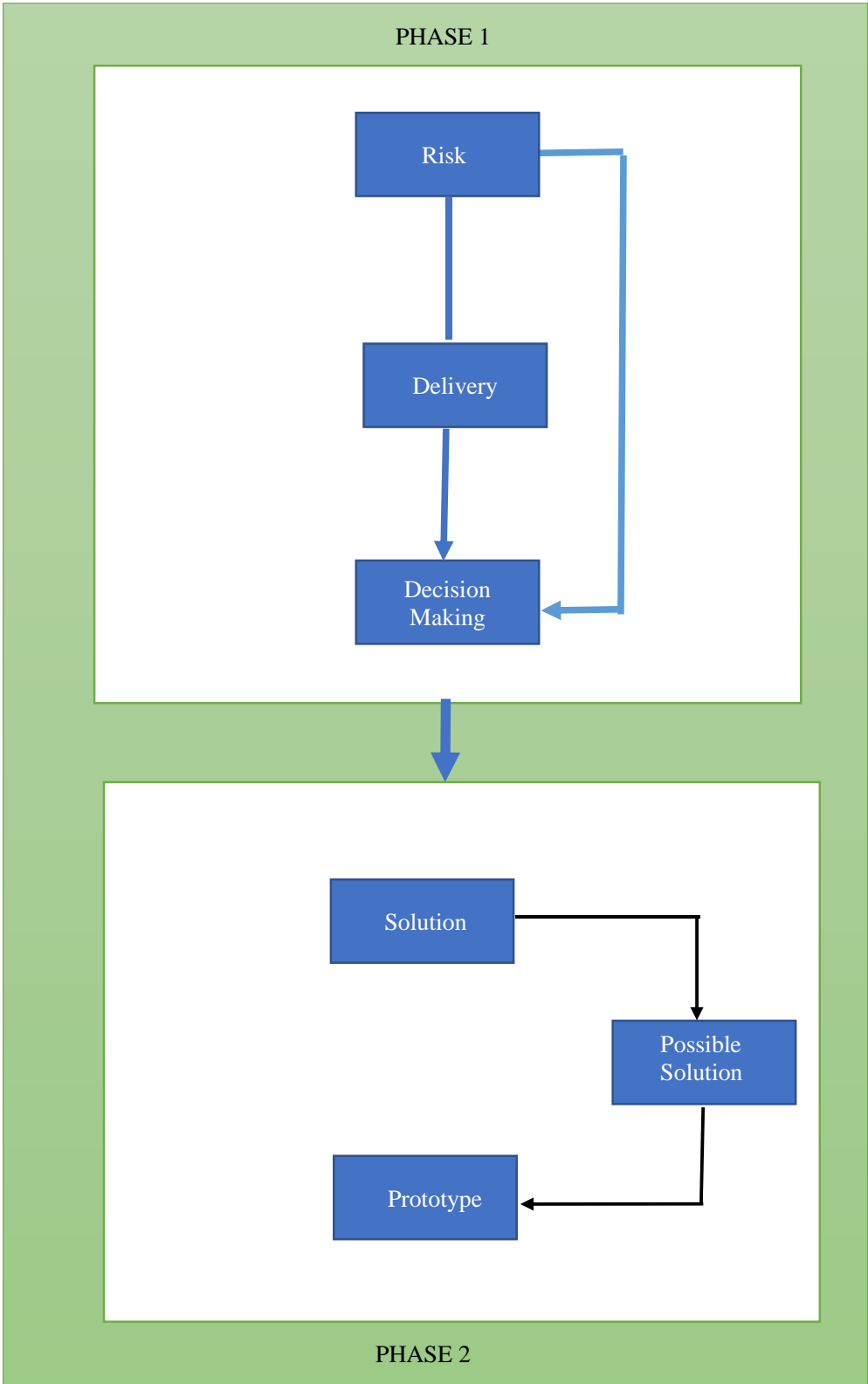
- i) What is the solution for security problems of delivery items.
- ii) What is the solution for the problem of item receipt time

## **INNOVATION DEVELOPMENT**

### **Research Framework**

The study is divided into two phases and each phase's output is an input to the next phase. Phase-1 (first phase) we do the literature review and continue with the survey in which the survey is implemented by using a questionnaire. The purpose of this survey is to get some information weather respondent having a trouble in receiving delivery packages and the risk.

Second Phase (Phase-2) involve an evaluation on the solution suggest by respondent. This phase also aimed to evaluate and find the possible solution suggest by respondents and develop the prototype of D-Box as a possible solution for the problem.



**Figure 1:** Research framework

## Research Method

For the purposes of this research, the writer has decided to use a sciences research tools questionnaires and interviews (Sarantakos, 2013). The questionnaires will be distributed among people from district in Kota Setar which most of them are working. There are 108 of respondent were selected for this survey.

## COMMERCIAL POTENTIAL

From the product developed, the in terms of package safety when no one is at home. Both parties, the delivery man and the receiver will benefit. many people are facing an issue where their parcel has lost because there is no one at the delivery address that can pick up the parcel as it is not secured. So, the case of a parcel lost is increasing each day. By using this product, the user will not worry much about their parcel lost because the user can check their parcel from time to time from the apps itself. Also, we have seen many complaints to the courier services towards the issues that the parcel just left there, and it was raining on that specific day. So, the items inside have a defect, especially for electronic items. So that is why D-Box invented with a waterproof material. The result shows positive impact hence saves the end user in a lot of aspects.

Based on the questionnaire, most of our respondents received delivery packages within the range of 0-2 by 55.2% followed by a 3-5 range of 33.3%. Meanwhile, 7.6% of the respondents received delivery packages within the range of 6-8. Ranges 9-11 and >12 have the same number of respondents as 1.9% as depicted in figure 6.

Most of our respondent says that they have experienced a situation where their parcel has arrived at the delivery address, but they were not home. Only 18% of respondent never encountered that situation before as depicted in figure 7.

95% of the respondent says that they are not comfortable with the risk of receiving the package without their presence at the delivery location as depicted in figure 8. So, through all the graph, we can see that D-Box enable a safe delivery process.

## CONCLUSION

To conclude, the problem solved with the innovated product hence improve warranty on the packaging. Many people can do anything without the need for packaging that is not at home. The courier also does not have to wait long when using the goods. This can save shipper time. Recipients also do not have to worry if the goods will be damaged due to rain because the D-Box is made using waterproof material.

## ACKNOWLEDGEMENT

The authors can include an acknowledgment to express their appreciation for the support of the sponsors. Include details such as research grant, individual(s), or name(s) of organization/institution.

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