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Customer Discovery of Indoor Gardening Technology: Study Case of Hi! Drops

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Abstract:
Internet of Living Things is a form of Internet of Things that has a specific purpose of helping living creatures live, and we call the lifestyle that is influenced by IoLT as Smart Living. Internet of Living Things can be implemented in many household areas. One of the famous product implementations of Internet of Living Things is the smart flower pot.
In this research, the researcher wants to analyze Hi!Drops based on their current situation. Hi!Drops creating smart flower pot that can help people to have effortless indoor gardening. Unfortunately Hi!Drops have no product-market fit because they lack customer knowledge. So, the researcher wants to explore the potential customer segment of Indoor Gardening products, especially for Hi!Drops products. Besides that, researchers want to understand customer's motivation in using the product and then design the sustainable business model for Hi!Drops products.
This research will use customer discovery methods and value hypothesis and growth hypothesis. Researchers use customer discovery to gain customer insight into the product and problem. The value hypothesis is for validating the product value that delivers the potential customer, and the growth hypothesis is the willingness of the customer to recommend the product to their colleagues. The data collection method will use qualitative methods. The result of this research is a sustainable business model and enriched data of market knowledge. The researcher hopes this research result can be used by Hi!Drops to develop their business.
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Keywords: *Customer segment, customer discovery, indoor gardening*

1. Introduction

Smart indoor gardening is becoming one of the most popular researches in IoT technology. Some companies have launched their products that work in the indoor gardening sector. For example, Xiaomi with their Xiaomi Mi Flora. IoT technology that is implemented in Indoor gardening functions to conduct plant maintenance activities, using sensor technology, IoT products for indoor gardening also use other technology breakthroughs such as automatic UV lightning technology and automatic watering systems to help indoor plants grow.(Habadas, 2018) However, in Indonesia there are no businesses that run by IoT for indoor gardening. Lack of market knowledge is one of the problems that businessmen in indoor gardening technology will face. So, the purpose of this research is to gather the market knowledge and to prove if such a market for high technology indoor gardening products does exist in Indonesia.

One of the start-ups that based on the product development types is a startup that brings a new product into a new market. The problem with this type of startup is that they don't have valid data to the first customership. One example of that startup is Hi! Drops. Simply put, the technology that Hi!Drops developed is the IoT for lighting and watering systems. This basic technology has a great opportunity to be implemented to solve many problems in the indoor agriculture area. The large implementation opportunity of this technology makes Hi!Drops do not have target market focus.

The study proposed methods that involved the potential customer in the product and market development process because engaging the potential customers in the process can help companies develop successful products. However, the main focus is on specifically determining the right customer segment at the early stage of product development.

Thus, the method that researchers use is the customer discovery (CD) approach. Customer discovery or CD is a method to define the customers needs by understanding the customers' preferences. and problems before the product development. Customer Discovery is the first step in the customer development model. In the customer discovery stage the researcher will test the company's initial hypothesis about the real market understanding and decide to continue the hypothesis or pivot.

2. Literature Review

2.1. Customer Development

In the 1990s, Steve Blank developed a systematic framework for startups to create successful products in an efficient way. Steve Blank thought that most startups lack research on their product idea hypotheses. Customer development is a step to discover and validate the business idea hypotheses. Customer development has been proposed to maximize the success of the product in the market. Customer development itself process is divided into four steps: . *1.*

2.2. Customer Discovery

Customer discovery is a process in which startups develop the hypotheses of their business models and then validate or invalidate those hypotheses. The validation is done by conducting interviews with potential customers (Batova, Clark, and Card, 2016). The aim of customer discovery is to determine if there are actual customers for the product/service and if they would want it before actually developing the product (Thamjamrassri et al., 2018).

Customer discovery consists of developing a business model canvas composed of multiple hypotheses and then testing those hypotheses through extensive customer interviewing. Initial hypotheses are created based on assumptions and intuition, and interview-based 'testing' shows if the problem that a customer wants to see solved is identified correctly; if the product or service of the lean startup can actually solve this problem; and if customers are willing to pay for the solution. (Batova, Clark and Card, 2016)

2.3. Customer Validation

Customer validation is the final step to make sure your customer needs (the problem and its solutions). It is also a stage for a startup to have a strategic plan of how they should sell their product. If a startup fails to validate their paying customers on the Customer Validation stage, they should return to the Customer Discovery stage to (re)discover what customers are willing to pay for. The purpose of the Customer Validation stage is to find a product or market fit. Product or market fit is a market with a product that satisfies that market. (Thati,2013)

2.4. Customer Creation

Customer creation is a stage that creates and drives consumer demand to scale sales. In this stage, startups need to define their market segmentation and the channel to sell the product. Different types of markets need different marketing strategies. So the main goal of the customer creation stage is creating a different marketing mix for different market types. (Blank and Dorf, 2012)

2.5. Company Building

Company building is a stage where informal companies that focus on discovery transform into formal companies that focus on sales. Informal company is the stage where companies do research to create a suitable product and business plan for their company and market. The next step after the company found its market and suitable business model. They should create formal company departments that usually divide into some divisions that handle sales, marketing, operation, and business development. (Cooper, Vlaskovits and Blank, 2010)

2.6. Lean Startup

Lean Startup Methodology is a new approach to development and a new product that was proposed by Eric Ries in 2008. Lean Startup method emphasizes the product and business development process on fast iteration and customer insight. It aims to streamline the product development cycles and swift the viable business model discovery. (Ries,2008) The result of lean startup implementation is to reduce the startup ventures for data gathering and potential customer segments research. It also reduces the waste of the production process by eliminating unnecessary processes. The efficiency process reaches by finding out if they have actual customers and understand what these customers want, before developing products or prototypes. (Batova, Clark and Card, 2016)

The product-market fit is the focus of the Lean Startup Method. Product-market fit is a product that can satisfy the market, or according to Blank and Dorf (2005), it has to find repeatable and scalable sales. To create the product-market fit, we need to have a feedback loop that consists of the cycle of our market research to build suitable products. In Lean Startup, core components are the Build-Measure-Learn cycle. The Build-Measure-Learn cycle has the purpose of validating the company assumptions to product and market. It turns uncertainties and assumptions into knowledge that the company can use for decision making.

In the Build-Measure-Learn cycle, there are three stages of creating this loop, there are Build, Measure, and Learn. By using this cycle, startups will realize what they should learn, and then find out what things they should measure for developing innovation. After doing this cycle, the startup will know if they have validated learning or not. The final result of the cycle they will figure out what product they should build.

To understand more about the cycle, we should understand each stage. The first stage is called build. In this stage, we should build an experiment and run the experiment. The build experiment means we should create the MVP (minimum viable product). MVP is a design experiment that consists of a minimum specification product that is built to test a number of hypotheses that have been formulated**.** After creating the MVP, we should run the experiment of the validation of the startup's product that is formulated in the MVP product. This experiment must use a proven and reliable method of research. The second stage is Measure. After collecting the data of the experiment from the previous stage, we need to process and analyze the result. This data must be analyzed, organized, and presented clearly to help the startup

understand the result. The last stage is Learn. Learn is the evaluation of the result of data analysis and the decision, do the company should do pivot or continue the current strategy. (Ries,2008)

2.7. Conceptual Framework

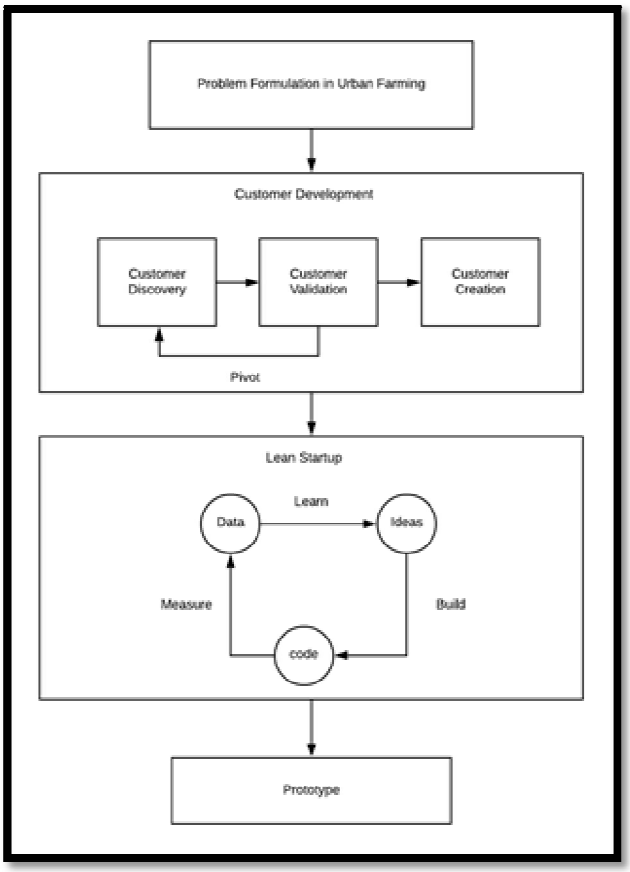

Figure 1: Conceptual Framework
Source : Researcher's Analysis

3. Methodology

The research interview had been conducted online using an online platform due to the Covid-19 pandemic in Indonesia. The research interview was done from 17th June 2020 until 5th July 2020. Researchers had conducted 12 interviews, divided into 3 customer segments. The first segment is the individual customer that will use the product for personal use, second, the interior designer and architect that will use the product for their design and the third segment is building management. Customer discovery can broke into 4 main stage, 1.) State the Hypothesis 2.)Test 'Problems' Hypothesis3.) Test 'Product' Hypothesis 4.) Verify (Blank, S. and Dorf, B., 2012)

4. Analysis and Result

4.1. Initial Hypothesis

Hi!Drops initial product hypothesis was a smart flowerpot system with web-based control.The smart flowerpot provides a UV lighting system and watering system controlled by a website. It comes up with the first problem hypothesis, Hi!Drops assume that buildings and houses will face problems in organizing indoor decorative plants and inefficient maintenance of indoor gardening methods. Hi!Drops assume the customer segment as the building owner or building manager, architect, designer interior, and individuals that are interested in doing indoor gardening at their home. To reach the customer, Hi!Drops hypothesize to use social media(Instagram) marketing, and offline marketing by joining exhibitions. To drive the demand creation, Hi!Drops assume to do direct selling. Furthermore, based on research conducted by Hi! Drops, there are no companies with similar products in Indonesia, so there is no previous research on the market, so the market type of this product is included in the new market category, and there is no competition with companies with similar products.

4.2. Initial Business Extraction

Initial business model extraction was created as the basic knowledge in testing problems. The researcher extracts two elements, which are value propositions and customer segments

Customer Segment	Value Proposition		
	Effortless Gardening Activity	Automatic Lighting System	Website monitoring
Building owner Architect Interior designer Individual	✔	✔	✔

Table 1: Initial Value Proposition Extraction
Source: Researcher Analysis

4.3. Test the Problem

Through the interview with our 3 customer segments, researchers define value propositions that are needed for each customer segment to solve their problem. so to enter each 3 market segments, it must make adjustments to the value proposition needed by the 3 markets. The summary of value propositions from the 3 markets is as follows:

Customer Segment	**Value Proposition**									
	System Watering	Lighting system	Portable design	Aesthetic design	Saving energy	Customize design	Guarantee	Maintenance Service	Flexible concept changes	Affordable price
Segment 1										
Individual	✓	✓	✓	✓	✓					
Segement 2										
Architect / Designer Interior	✓	✓				✓	✓	✓		
Segment3										
Building Management	✓	✓						✓	✓	✓

Table 2: Customer Segment and Value Proposition Extraction after Customer Discovery
Source: Researcher Analysis

4.4. Market Understanding

After identifying the possible customer segment and describing the value proposition needed by each customer segment, the researcher decides to purpose the Hi!Drops to change the target market from building managers, architects and individual users to be focused only in the individual user customer segment. Although Hi!Drops can fulfill the need for feature watering and UV lighting for customer segment III or building owner/manager, Hi!Drops' products can not fulfill the needs for flexible concept changes. The indoor gardening system is permanently installed because it requires additional installation for electricity and water sources. Both of these are things that are not easy to change or move. Other than that, there is a need for weekly service maintenance, which cannot be held quickly by Hi! Drops are given their limited startup resources. These two requirements conflict that Hi!Drops cannot fulfill both. Thus, the researcher did not recommend this segment.

Customer segment II or architect and designer interior prefer the customized product. They suggest researchers sell the installation system only and cooperate with other designers for the design. But besides that, they also want a maintenance service for the system. This customer segment uses products for decoration materials for their clients, so service for client convenience and continued installation is very important.

Researchers concluded that providing value to customer segment I, individual customers is the most attractive business model for several reasons. First, the customer segment I identified has a problem with the lack of sunlight in the room to make the plant healthy and can grow. Second, they need aesthetic and portable design, and both needs can be provided by Hi!Drops with all the limitations of its resources.

4.5. Verify the Business Model

Based on all tests performed and model testing business, model verification is carried outright. Verification is based on product compatibility with the market, verify the channel, and verify whether the model business can make money and companies.

According to Blank and Dorf (2012), product compatibility with the market (product-market fit) has three components as parameters. Components that are whether the problem or need is addressed urgently or important for many customers, whether or not a product can solve a problem meeting the needs of customers and customers are happy to pay for it, as well as whether there are large enough customers made business opportunities. The test results obtained show that the problem so far is that the respondents are individual users who act as decision-makers and have problems with indoor gardening and daily nutritional consumption of children in force as an end-user. These problems include lack of sunlight, doubt on the quality of nutritional content, needs for appearance, and need for taste. These problems fall into the problem category where the type of active problem and vision respondents understand the problem, find their own solutions such as by moving the plant to the place with high sunlight exposure, but want another solution and are willing to pay more for better products.

In submitting solutions, most respondents gave positive responses to the product. Respondents stated that the product simply solves the problem and is very good product innovation. Some respondents suggested lowering the price of the product.

Hi!Drops is segmented for individual users who are indeed interested in growing indoor plants aged 20 - 40 years, living in the city of Bandung and Jakarta. The total population in Jakarta and Bandung is 13 million (13,038,274). Researchers focus only on age groups 20- 40,the selected age groups have 5.5 million people (5,528,738) or worth to 42.4% of the total population.

Hi!Drops is an innovative product that targets individual users in a big city. To make a market acquisition, Hi!Drops need to educate the market about the value that the product provides. To educate the market Hi!Drops can use online platforms such as Youtube. Based on the research target market said if they used to find the information about gardening activity on youtube.

One of the important factors in analyzing the potential for increasing revenue is the market size analysis. Hi!Drops main target is individual users who are indeed interested in growing indoor plants aged 20 - 40 years, living in the city of Bandung and Jakarta. Based on the analysis, the target market is determined at 5,528,500 million rupiah per year. With a production capacity of 500 products per month, this product can generate money and grow the company if it is sold at a price of Rp 500.000 per product.

5. Conclusions and Recommendations

5.1. Conclusion

Although the researcher failed to conduct 15 interviews in customer discovery. Customer Discovery still helped the researcher to find the right customer segment for Hi!drops. Hi!Drops will spend more resources for developing product and marketing for their 3 customer segments and realize later if their product is not suitable for 3 segments.. Next, after the researcher does the customer discovery, the researcher finds out if the right customer segment for Hi!Drops is the individual user. The building management and architect are not suitable for Hi!Drops capability because there are some requirements that Hi!Drops fulfill.

5.2. Recommendation

Researchers recommended the company to start focusing their business and production activity to individual customer segments. Companies can start market research to understand the individual user needs and motivation to do indoor gardening, and design suitable product design and features.

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