

A Review on Service Business Model Using IoT

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ABSTRACT

The connected devices have become an important element for businesses as it provides significant innovation in business model. This paper discusses on the different business models which contributed to the values of businesses. As for the vertical business model, we have learned that different types of integration can be applied to other companies and manufacturers as a method to access the resources needed for the development of a product. By using a vertical business model, companies are able to control its suppliers and retail location directly without any external influence. As such, it provides greater flexibility and control in the overall business operations.

Keywords: Business model, IoT, Subscription, Vertical.

1. INTRODUCTION

According to [4], a business model can be defined as a structure of components that describes how profit and revenues are made through the customers and suppliers of a company. An appropriate business model that aligns with the company's goals and targets should be implemented as it helps the company to maximize the usage of their resources for the purpose of boosting profit and reducing costs. The IoT business model is mainly concerned with capturing and delivering values that has a connectivity up to 24/7 [12-19]. Thus, with the appropriate business model, companies can keep up with the change in technology as well as the market trends. In this section, essential components of the IoT service business model, the subscription business model and the vertical business model will be discussed.

2. IOT SERVICE BUSINESS MODEL

According to a study by [6], which conducted a research on some business model components, four essential components of the IoT service business model have been identified namely the value proposition, networked activities, resources and sustainability.

The first component is value proposition, which refers to a considerable amount of product or service that will be provided to a target consumer for which the consumer is

willing to pay for [6]. In simpler term, a value proposition is a reason for a customer to purchase the company's product or service instead of a contender's products. A value proposition provides a statement that informs the consumers on the company's directions and operations as well as the benefits the customers will receive by giving them business. It is considered the most important component in a business model because it is a determinant of success or failure in terms of marketing and sales for a business. [2] also made a similar statement where the performance, success rate, comfort and future updates within the value proposition component is the most important element in the IoT business model.

In IoT context, the value proposition of IoT services is established as new services or values are recognized by consumers as a result of the implementation of IoT services [6] [20-23]. The value proposition of IoT services also focuses more on the impact or solutions of the services to solve the customer's problems. It has to be fascinating to the customers so that they will choose the company's services rather than opting for other services but at the same time, it must generate revenue and reduce costs [6].

The second component is networked activities. According to [6], the networked activities is associated with a network of platform developers, partners, suppliers and other companies that adds value to the research and development of IoT services. The term "networked

activities” can be related to the term “key partners” in the business model canvas framework, which is the collaboration between companies to achieve the goal of producing attractive values for the customers [3]. In short, the network is basically the partnership or connection that a company has with other businesses, government or non-consumer bodies that allows a business model to function. The partnership may involve suppliers or other business partners that will be the force that helps a company to thrive in areas that are unable to be achieved by just a single person or organization. According to a study by [2] the most important business partnerships in the network in the IoT business model context are the software developers, hardware suppliers or producers, launch customers and data analysts.

The third component is resources. Resources are the main inputs that allows a company to create a value proposition and bring it to life and provide services and products to the consumers. It is important because resources are the key factors of the success of a business model. The resource component assists businesses in analyzing and reviewing the sustainable and development resources in terms of internal and external factors to create a competitive advantage over their competitors from the IoT service growth [6]. This means that each organization will utilize a set of specific and unique resources that differs from their competitors in the product development to maximize opportunities and fight threats against the company. Based on the study by [6], several key resources of enterprises such as employees, technologies, brands and marketing techniques etc. that contributes to the development of IoT services have been identified. The acquisition of those resources is also considered a key resource development activity, which further contribute to the sustainability, success and profitability of a company in years to come.

The last component is sustainability. Sustainability is usually concerned with the management of the triple bottom lines, commonly known as profit, people and planet [6]. Businesses have incorporated sustainability into their operations and business models to achieve the goal of corporate and revenue growth for an indefinite amount of time and at the same time, fulfil environmental and social responsibilities [6]. This means that companies will try to contribute or return something back to the society and the environment to achieve a long-term sustainability. In IoT service development, companies would take into consideration the impact of the manufacturing of the products and services on the people, planet and profit. For instance, companies may develop their products based on the business and environment ethics where pollution to the environment should be minimal to protect the company’s, the society’s and the environment’s interests.

[6] also stated that the types of sustainability depend on the cost and revenue side of the IoT service development. This is because IoT service development require an amount

of investment initially, but those investments will pay off in the later stage as the values and returns created by the IoT services are huge. The investment in IoT green manufacturing also leads to a better public relation that will increase the revenue over a period of time [6]. Hence, in a long-term sustainability, the value generated by the IoT services sold to the customers will greatly surpass the cost of the service development.

3.SUBSCRIPTION BUSINESS MODEL

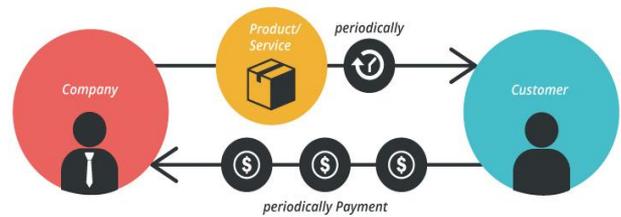


Figure 1 Subscription Business Model [9] [11]

A subscription-based business model can be described as a continuous distribution of a product’s or service’s value proposition for a recurring fee in a period of time [9]. In simpler terms, a subscription model is based on the idea of selling a product or service with the aim of receiving a monthly or yearly subscription fees from the consumers. The main focus of the subscription model is the retention of existing customers instead of acquiring new customers. In comparison to the traditional one-time product-oriented purchases, the subscription model allows businesses to focus on the provision of integrated products and service packages, a long-term partnership and connection between the suppliers and customers, the satisfaction of customer needs and benefits as well as the recognition of the potential of Industry 4.0 to an organization [9]. These elements that the subscription model offers caused many organizations to move on from the one-time purchase model to the newer and more efficient subscription model.

According to [9], there are several types of subscription model that offers different types of services and usage. The first is the unit-based subscription, where the consumers receive a product or service on a fixed price basis. The second is usage-based subscription. A research by [1] indicates that in the usage-based subscription, an initial subscription fee which is fixed will be charged and another fee which is the usage fee is variable depending on the number of times you use the product or service. The third is user-based model that focuses on the number of individual users of a particular product or service. The fourth is the unlimited model where consumers have an unlimited access to products and services after payment of the fees. The fifth is the tiered model where different subscription options and services are offered to the customers based on their interests. The last is the hybrid

model, where consumers are allowed to use the product or service for a period of time and after once the subscription limits are exceeded, excess fees will be charged to allow continuous usage [1].

The benefits of implementing a subscription model is that businesses are able to have a strong, positive and active relationship with the customers that subscribed to the company’s product or service. This is because IoT devices are constantly gathering the data from the customers and those data may be used to learn about the customer’s preferences, allowing companies to produce products or services that can cater to the customer’s specific needs. Another benefit of subscription model is that paid upgrades or premium models may be further implemented into the product or service to increase the revenue generated. An example of a company that uses subscription model is Netflix. Through the subscription model, Netflix managed to better understand their customer’s needs and by satisfying those needs and offering various subscription packages that have different benefits, the company is able to transform from a DVD seller to one of the world’s most well-known streaming platform and movie production of all time [9].

4. VERTICAL BUSINESS MODEL

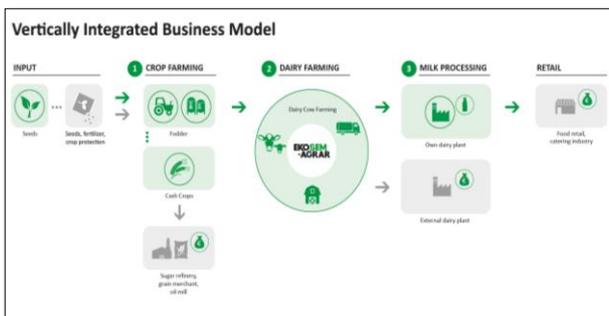


Figure 2 Vertically Integrated Business Model [8] [12]

A vertical business model is a model where the IoT equipment, gateway and Cloud utilities are all provided and managed by a single organization [8]. A vertical business model is based on the concept of vertical integration strategy, whereby an organization controls its suppliers, dealers and retail locations directly to ensure that its value and supply chain is not affected by the influence of other external factors. According to [10] and [7], there are two types of vertical integration which are forward integration and backward integration. A forward integration focuses on the control of the service and retail price while the backward integration focuses more on the control of wholesale and retail price [7]. These two strategies may be implemented into the business model depending on the type of strategy the company use to tackle the development of a new product.

The main advantage of the vertical business model is that there will be no compatibility problems that needs to be resolved between the different elements in the IoT component or device. Even in the case whereby problem arises, the end users may just simply contact the organization that provided the service or product as there is only a single point of contact available for troubleshooting. This saves time for the end users as there will not be a need for them to run around for a solution. However, the downside of a vertical business model is that any possible future enhancements or upgrade to the product is fully dependent on the manufacturer itself [8]. Another downside is that problems will arise when new things such as sensors are added to the model or when the business model receives some further change or improvement that may benefit the organization.

An example of the usage of vertical business model can be seen in the technology giant, Apple Inc. Apple Inc owns multiple retail and manufacturing facilities around the world that is used for the development of their technologies and products. A type of vertical integration can be seen in Apple Inc when they acquired AuthenTec in 2012, a company that makes the fingerprint sensors available on their iPhones. Apple Inc also further expanded their laboratory in Taiwan in 2015 that focuses on the development of the LCD and OLED screen used in their products [5]. By using the vertical business model, Apple Inc has benefited in the sense it is now one of the biggest technology company worldwide and that it has full control on the development of its own products.

5. CONCLUSIONS

In this section, discussion on the essential components of the IoT service business model, the subscription-based business model and the vertical business model have been done. The discussion on the essential components of an IoT service business model provides an insight to how businesses create value from their products and services. Key points such as value propositions, network or partnerships, organization resources and sustainability of the product or service that can contribute to a success of a business model have been identified and companies should use key points that complements their aims and objectives in the design of their business models as each company have different goals. In this study, we have also learned that the subscription-based business model is based on a monthly or yearly subscription fees. There are also different types of subscription services available for consumers and the benefit of this model is that there is a stronger and more active interaction between the service providers and the customers. As for the vertical business model, we have learned that different types of integration can be applied to other companies and manufacturers as a method to access the resources needed for the development of a product. By using a vertical business model, companies are able to control its suppliers and retail location directly without any

external influence. As such, it provides greater flexibility and control in the overall business operations.

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