

Designing E-Business Startup: Potato Indofarm

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Abstract— This paper aims to analyze the business opportunities for the potato farmers at Dieng Plateau, Wonosobo, Central Java, allowing them to sell the potato products much easier. So far, they have been selling the potato products to the middlemen both in large and small quantities. This paper also aims to design the information system consisted of a web-based application which can be used to support the business of potatoes. This paper uses industry and competitor analysis utilizing Porter's Five Forces Model and Marketing Mix 4P(s). Also, the model of e-business startup of Potato Indofarm uses Business Model Canvas. The method used in this research is Object Oriented Analysis and Design (OOAD) with Unified Process using three disciplines, namely business modeling, requirements, and design. Several Unified Modeling Diagrams (UML) were also used in modeling the system requirement. The design of the website provides features of search, categories, negotiation, and others. The designed website is expected to become a solution and can fulfill the needs of sellers and buyers of potatoes. So the website can shorten the distribution channel.

Keywords— Web-based application, e-business startup, potato farmers, Dieng Plateau.

I. INTRODUCTION

In the last few decades, the development of Indonesia economy has been robust, despite the obvious economic shrinkage occurring during the Asian financial crisis in 1997 to 1998. The Central Bureau of Statistics (BPS) released the results of the 2018 economic growth of 5.06 percent, which was higher compared to 2017 of only 5.01 percent. Judging from the healthy growth rate, Indonesia can play a vital role in the global economy. The Indonesian government expects economic growth to increase by promoting international trade. This expectation is supported by Schumpeter's theory as referred by Sukirno (2012), alluding to the importance of international trade conducted by entrepreneurs in realizing the economic growth.

There are four major industries contributing to the Indonesian economy. In 2018, the agricultural sector contributed by 35.10% which was the largest, while the hotel and restaurant trade sector contributed by 15.90% in the second position. In the third position, the service sector contributed by 14.71%, and the creative economy sector contributed by 11% as the fourth largest contributor to economic growth. These are shown in figure 1 as follows.



Source: Agribisnis.co.id (2020)

Figure 1. Contribution of creative economic sector and others to the Indonesian economy

II. LITERATURE REVIEW

Wonosobo Regency is 120 km from the capital city of Central Java (Semarang) and 520 km from the State Capital (Jakarta). Wonosobo is also one of 35 regencies/cities located in the central part of Central Java Province. Geographically, Wonosobo Regency is located between 70 11' and 70 36' South Latitude, 1090 43' and 1100 04' East Longitude. Other characteristics include:

- The average temperature is 14.3-26.50 C,
- Annual rainfall 1,713-4,255 mm/year,
- Located in the range of 250 dpl – 2,250 mm dpl with dominance in the range of 500 dpl – 1,000 dpl of 50% (percent) of the entire area.
- Annual rainfall ranges from 3,541-6,445 mm/year.

Characterizing the highlands as an area of Wonosobo Regency with a special position in the middle of Java Island and located between the north coast and the south coast. Thus making Wonosobo very good for agriculture.

Figure 1 shows that the agricultural sector has the highest contribution to the Indonesian economy, but the transactions were done offline. Figure 2 shows that the transactions of agricultural products, especially potatoes, had never been done online using the website. Indonesian people still prefer offline transaction in buying and selling potatoes.



Source: Bisnis.com (2020)

Figure 2. Prediction of e-Commerce growth in Indonesia

Gunawardana, Kennedy D.; (2018) Growth of e-commerce is the new born business method, which has originated through an extensive usage of IT in their business. The results on the adoption of e-commerce showed a significant relationship with the two firm-based characteristics. That is management involvement and adoption of IT.

Definition of Website

Laudon, Traver (2011), when the internet was born in 1960, the website was not discovered until 1989-1991 by Dr. Tim Berners-Lee, a European physicist. According to Kotler, Armstrong (2014), a website is built or formed to build goodwill with customers and complement other sales channels and not to sell company products directly. Hidayat (2010), the website is the entire web page contained in a domain that contains information. A website is usually built on many interconnected web pages.



Source: Kotler & Armstrong (2014)

Figure 3. Online Marketing Strategy

Definition of E-Commerce,

Totonchi and Kakamanshadi (2012) E-Commerce is the exchange of goods and services between four broad groups over the Internet. This can happen between businesses and consumers, businesses and businesses, intra-companies, and consumers and consumers. According to Chan, Elsie & Swatman, Paula M.C. (1999), The way business organizations conduct business activities has changed with the introduction of e-Commerce. Beginning in the 1970's there are three parts of business trading that come together in providing infrastructure and techniques, namely logistics management, global networks and business document exchanges, which we know today as electronic commerce.

Definition of Startup

According to Nirwana, Michael Dwianto; Dhewanto, Wawan; (2014), Lean Startup Methodology is aimed at changing the company's perspective on mindset and business approach for new products to be launched or being developed. Actually this theory comes from Lean Thinking or Manufacturing, a management approach that was first applied by the Toyota factory production system. Meanwhile, Calopa, Marina Klacmer et al., (2014), pointed out that startup is the new organization which is still in the development phase and requires market research.

Definition of E-Business,

According to Chaffey (2009), e-business is the process of information exchange using the electronic system, both inside the organization and between the external parties to support the business process. According to Laudon & Traver (2014), e-business is the digital process and transaction in a company using the information system of the company.

Definition of E-Marketplace

According to Zheng, Weijun; (2006), Electronic Marketplace (EM) is the exchange of information between organizations that allows participating sellers and buyers to exchange information about product prices and offers and cooperate in an integrated manner in commodity exchanges.

Table 1. Differences in E-Marketing, E-Commerce and E-Brochure

e-Marketing	e-Commerce	e-Brochure
Displays complete information about the company	Displays complete information about the company	Show brief information about the company
Communicating and promoting products or services via the internet	Selling and buying a product via the internet	Communicating and promoting or services contained in a web or social media
There are no online transactions	There are online buying and selling principles and online transactions	There are no online transactions
Can be in the form of a stand-alone website or using social media	Can be in the form of a stand-alone website or using social media	Not in the form of a web, but into the content of the web or social media

Source: Sarjono (2020).

Definition of Design

According to Satzinger, Jakson, & Burd. (2012), system design is a process of specifying in detail how all components in an information system should be implemented.

Definition of Object – Oriented Analysis (OOA)

According to Satzinger, Jackson, & Burd. (2012), Object – Oriented Analysis describes all types of objects that work within a system and shows what use case needed to complete the task in the system to be designed.

Definition of Object – Oriented Design (OOD)

According to Satzinger, Jackson, & Burd, (2012), Object-Oriented Design is to define all types of objects needed to communicate with humans and devices in the system, and show how objects interact in completing tasks, and perfect the definition of each type of object so that it can be implemented.

Business Model Canvas

According to Osterwalder & Pigneur (2002), Business Model Canvas is a business model for defining, visualizing, measuring, and changing the business model.

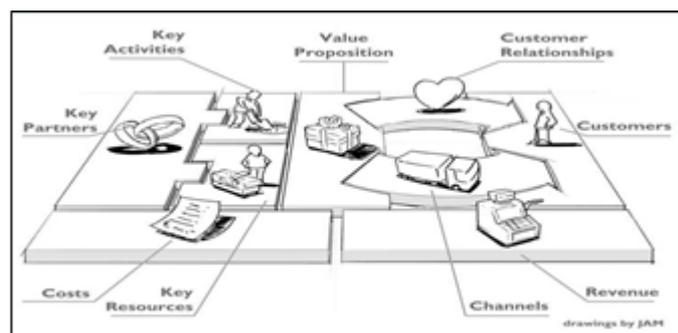


Figure 4. Business Modal Canvas

Nine Building Blocks become the basis of Business Model Canvas as shown in Figure 3. Key Activities are the activities in generating value propositions. Value Proposition is the value or benefit provided to customers so that they prefer the products offered by the company, compared the products of the competitors. Customer Relationship is a way of establishing relationships with customers while Key Partners are those who work together to run a business. Structure costs provide an overview of the costs needed to run a business, while Key Resources describe the most important activities involved in value creation. Channels are the ways to reach customers, while Revenue Stream is the income generated in a business. Customer Segment is the core of business because, without the customers, a company will be difficult to develop and get profit.

Traditional Marketing vs Digital Marketing.

Traditional marketing is a form of marketing that has been past and most widely known, where traditional marketing is non-digital ways that are used to market the products or services of a company's business entities. On the other hand, digital marketing is the marketing of products or services that use digital channels to reach their consumers. So it can be concluded that digital marketing is an effort to market products or services through digital technology in achieving its goals. Digital marketing is also the identity of a company how to display the identity of the company, its products or services in cyberspace, so that with the help of digital technology, the brand of a product or service can reach every consumer more efficiently and effectively.

Table 2. Differences in Traditional Marketing vs Digital Marketing

No	Traditional Marketing	Digital Marketing
1	Traditional marketing includes print, broadcast, direct mail and telephone	Digital marketing includes online advertising, email marketing, social media, text messaging, affiliate marketing, search engine optimization, pay-per-click
2	No interaction with audience	Can interact with audience
3	Results are very easy to measure	Results for the most part are easy to measure
4	Expensive and time consuming process	Quite cheap and fast way to promote your product or service
5	The success of traditional marketing strategies can be celebrated if the company can reach a large local audience	The success of a digital marketing strategy can be celebrated if the company can reach a certain number of local audiences
6	One-way conversation	Two-way conversation
7	Responses can only occur during business hours	Response or feedback can happen at any time
8	No chance to go viral	There is a possibility to go viral
9	One campaign lasts for a long time	Campaigns can be easily modified and innovations can be introduced in any campaign

Source: Yasmeeen, Tasnem & Fatema (2015)

Digital marketing steps:

In digital marketing activities there is the term AIDA (Awareness, Interest, Desire and Action), especially in the process of introducing products or services to the market (consumers).

1. Awareness (Awareness)
 In the digital realm, marketers build consumer awareness by placing advertisements in online media first.
2. Interest
 Interest arises after building awareness in consumers. Offline system, consumers directly look for information in the market. Online system, consumers find out about products through search engines (Google, Yahoo and others) and social networks (Facebook, Twitter and others).
3. Desire
 Confidence arises in consumers so they want to try the product or service. The online system is characterized by searching for complete information about products or services through websites.
4. Action
 The last stage is the determination of the consumer towards the product or service.

The keys to successful digital marketing include:

- Must pay attention to terms in AIDA (Awareness, Interest, Desire, and Action)
- The market is a place of two-way communication between sellers and buyers. To obtain this communication, brands must position themselves first, through various media (forums, blogs, etc.) and the most effective way is through social networks. via facebook, twitter, email, google and others

Marketplace Appeal

According to Apriadia and Saputra (2017), there are several advantages that e-commerce marketplaces have and that business transactions do not have offline. Factors that attract buyers to transact online:

1. Products, are many types of products that can be marketed and sold via the internet, such as clothing, cars, bicycles and others.
2. The place to sell products is the internet, which means you must have a domain and hosting.
3. How to receive orders, such as email, telephone, sms and others.
4. Payment method, using credit card, paypal, cash
5. Shipping methods, using Pos Indonesia, JNE, EMS and so on.
6. Customer service, email, contact.

III. MATERIAL AND METHODS

This research was carried out descriptively with qualitative methods that have the potential to explore new knowledge in the marketing system for potato farmers in Indonesia, it is not a new thing in marketing research, but the effort to introduce a website to farmers is not an easy thing, considering that it has been decades for farmers. Sales of their potato crop yields always depend on collectors. Primary data from this study were obtained from several sources, including:

- Directly ask 6 farmers who are working in their potato garden
- Directly ask 11 potato farmers at night, after they return from their gardens, by gathering the farmers at the house of one of the villagers in Kejajar sub-district.
- Ask directly to one of the village heads in the Dieng mountain area.
- Ask a potato collector directly.

From all the results of the interviews used as primary data in this study.

The secondary data was carried out by reading books and journals related to the traditional marketing of potato farmers, and potato farmers in Wonosobo were selected as samples in this study which were selected by purposive sampling.

Purposive sampling (also known as judgment, selective or subjective sampling) is a sampling technique in which the researcher relies on his or her own judgment when selecting members of the population to participate in a study.

The selection of the research location, namely Wonosobo Regency, was carried out purposively, Wonosobo has 15 sub-districts, where each sub-district has 16-21 villages/villages, with an area of 984.68 Km² and a population of more than 750 thousand people, the majority of the population in the Wonosobo area whose livelihood as potato farmers and depend on the farming. Of the 15 sub-districts, only 5 sub-districts produce potato plants with Kejajar sub-district as the largest potato producer, with an area of 2,853 ha and production of 435,493 quintals.

The methods used in this research are as follows:

- Method of data collection
 - Literature study. We collected data and information from academic journals, books, internet, and others.
 - Questionnaire. We collected data and information by interviewing related parties.
 - Observation. We directly observed the phenomenon related to this research.
- Five Forces Porter Model to analyze the industry and Marketing Mix 4P(s)
- Business Model Canvas to Design Business Planning

Osterwalder and Pigneur (2002) explain that consumer empathy maps are made to produce a strong business model, because customer profiles are very helpful in designing better propositions, ways to approach customers who are more comfortable and in touch with appropriate customers who ultimately provide understanding more in depth about how customers get satisfaction with the value of products / services when compared to the price offered.

- Object Oriented Analysis Design (OOAD) using framework Waterfall to analyze and design the website of Potato Indofarm.
- SWOT Potato Plants Farmers

Internal

Strength	
1	Become a permanent livelihood for generations
2	Potatoes are a source of carbohydrates that can substitute people's basic food needs.
3	There is support from the regions to realize competitive advantage and competitiveness.
4	Family support
5	Altitude suitable for potato cultivation
6	Land suitable for potato cultivation
Weakness	
1	Limited capital.
2	After harvest, cannot save the harvest (wasteful).
3	Low level of hereditary education.
4	Difficult to change (go forward), relatively old-fashioned.
5	The way of farming is still traditional since the first.
6	Using simple farming tools.
7	Sales of harvested produce, only to buyers who have been known for a long time (collectors), even though the harvest is not priced according to the market price.
8	Excessive use of plant pesticides.
9	Most of the Dieng area is a protected forest area. Limiting potato crops to avoid further environmental

	damage.
External	
Opportunity	
1	Potatoes are one of the horticultural commodities that play an important role in the realization of food security, especially in the highlands of Indonesia.
2	Potatoes are the main food ingredient for foreign nationals.
3	Export potential which is a source of foreign exchange for the country.
4	Support from national and local governments.
5	Changes in people's lifestyles on the benefits of vegetables (increased vegetarian community).
6	Innovation in providing added value for highland vegetable commodities both upstream and downstream.
Threat	
1	2015 AEC (Asean Economic Community) Free Trade Agreement.
2	There are fluctuations in vegetable prices.
3	Farmers' accessibility to final consumers and retailers has not developed optimally.
4	The issue of environmental sustainability that demands the development of agriculture that pays attention to environmental sustainability.
5	Soil has the potential and is prone to erosion.
6	Limited availability of organic fertilizer.
7	Limited partnership.

Source: Results of interviews, various sources and processed by the author (2019)

IV. RESULT AND DISCUSSIONS

The five-force Porter is a powerful instrument in understanding the competition of the industry. The explanation of five-force Porter is as follows:

Rivalry among existing competitors

Potato Indofarm is a website that provides a place for potato sellers with a bargaining feature for potato buyers. The company included as the competitor of Potato Indofarm is a website that can connect the provider of potatoes and potato buyers. Some firms which are in accordance with this criterion are PT. Tiga jaya cahaya lestari and Indotrading.

Bargaining power of suppliers

Suppliers may have high bargaining power if the number is small while the demand is high. Suppliers in this business are farmers or sellers of potatoes and internet hosting providers in Indonesia. It can be said that the power of supplier in this research is relatively small to medium because there are still many sellers of potatoes outside Dieng, Wonosobo, Central Java.

Bargaining power of customers

The bargaining power of buyers will also be considerable if the number of buyers is small and the number of substitute items is high. Farmers and potato buyers both have an equal role because both use the website. Buyers have another choice to obtain potatoes such as traditional markets which are numerous.

Threat of new entrants

New players will be a threat to the existing industries. The government program, namely '1000 National Startup Digital Movement', allows new players to quickly enter the same industry, resulting in many new competitors for the existing players.

Threat of substitutes

Substitute products provide consumers choices to meet their needs. In this case, the threats of substitute for potatoes are sweet potatoes, corn, sago, and rice which are all the staple food. So that the four commodities can replace the potatoes.

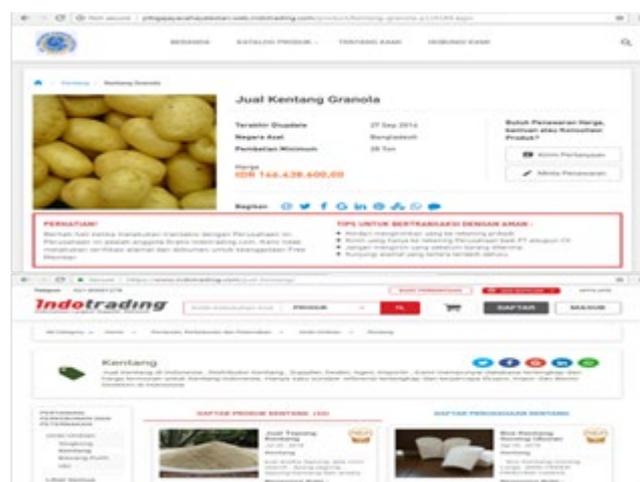
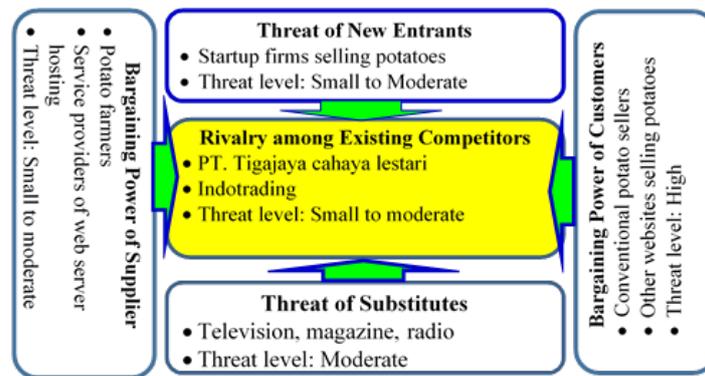


Figure 5. Websites of Indotrading and PT. Tiga Jaya Cahaya Lestari



Source: Processed data (2020)

Figure 6. The analysis result of using Porter's Five Forces Model for Potato Indofarm

So far, potato farmers are very dependent on collectors, before harvesting potatoes, collectors have given a down payment for the purchase of these potatoes and this activity has been going on for years, it cannot be eradicated or minimized, except by a regulation from the central government, which does not allow such transactions. If only local government regulations, it will be less effective at the regional level.

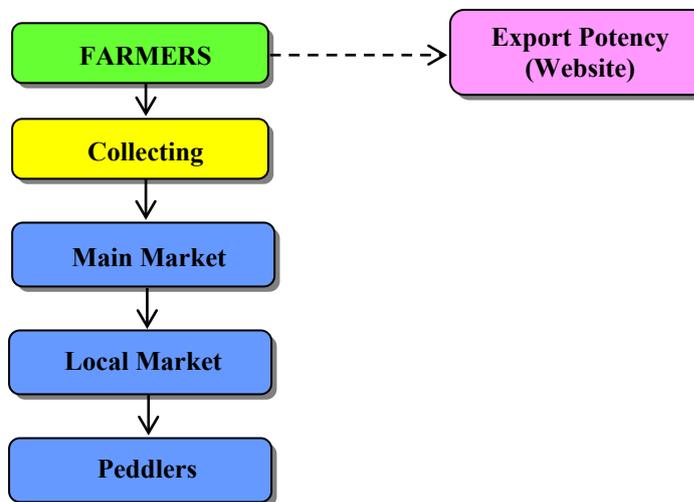


Figure 7. Potato sales distribution channel in Indonesia

It is rare for potato farmers who want to try selling directly to direct buyers, without going through collectors, when farmers start trying to sell directly using the website, it can be with the seller's own version or done through cooperatives in each farmer's area.

The design of supply chain networks by minimizing the role of collectors, even though they cannot eliminate them altogether, will increase the profits of the farmers who have been perceived as lacking, therefore a website that can sell farmers' products directly to buyers is needed (Sarjono, Sanny, Melati, 2018). To analyze the business model of Potato Indofarm, we used the Business Model Canvas as shown in figure 5 as follows.

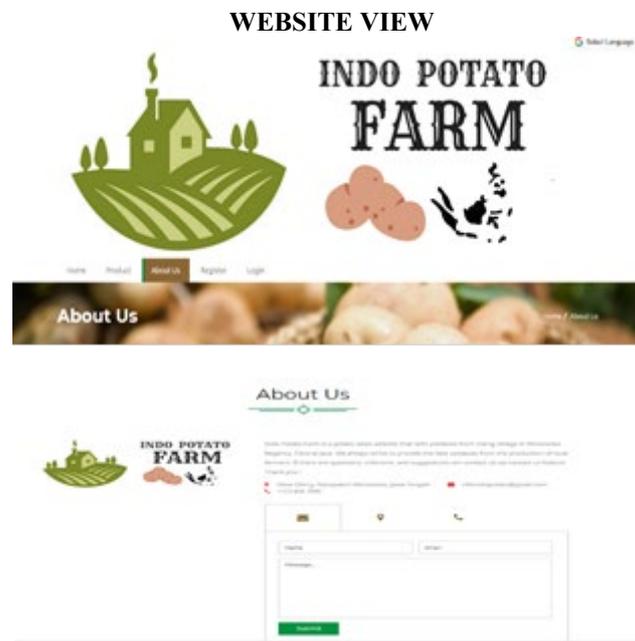
Key Partners • Potato sellers • Service providers • Couriers for delivery • Internet service providers • Service providers for server of hosting	Key Activities • Marketing / Promotion • Partnership with couriers Key Resources • Programmer • Website • Employee	Value Propositions • Free • Safety • Convenience • Automated Bargaining feature • Easy to access	Customer Relationships • Social Media • Contact us Channels • Website of Potato Indofarm • Social Media	Customer Segments Mass market (can be used by people needing potatoes)
Cost Structure • Employee Salary • Advertisement • Domain & Hosting			Revenue Streams • Premium Account • Advertising	

Source: processed data (2020)

Figure 8. Business Model Canvas of potato farmers at Dieng Plateau

The customer segment of Potato Indofarm is a mass market so that products can be used by the public. Potato Indofarm's value proposition is to provide convenience to potato buyers because they can search for various types of potatoes and can obtain bargaining features that can be accessed when registering as a premium account. Potato Indofarm does not ask for fees in the transaction process. Safety aspects are also offered because buyers pay in advance to Potato Indofarm. After the seller sends proof of invoice, Potato Indofarm will pay to the seller to minimize the probability of fraud. The use of the website makes it easy for users to use Potato Indofarm without having first to download the application. The website can be accessed by any device as long as it is connected to the internet. Buyers can use the internet, social media, and Potato Indofarm website to reach potential customers.

Potato Indofarm uses Contact Us and social media to establish relationships and maintain customer loyalty. Customers can contact 'customer service' at the 'Contact Us' or 'social media' section if they want to ask directly. The Value Proposition used by Potato Indofarm is a subscription fee and advertising. Subscription fees are applied to premium accounts where they will get more benefits, one of which is to get a place for advertising on the front page of the website to reach the prospective potato buyers. Key resources of Potato Indofarm are a website, brand, programmer, employee and financial capital. These resources are needed to create value for customers. Potato Indofarm's Key Activities are doing promotions to increase brand awareness, so the farmers are better known, and making partnerships with shipping services or couriers so they can provide faster and more reliable services. Key partners of Potato Indofarm are potato sellers or farmers and internet hosting/server providers. Costs incurred are the cost of the internet, hosting/server and domain, employee salaries and advertisements.



V. CONCLUSION

In this research, several conclusions can be drawn as follows:

1. There are price fluctuations in potato commodities, potato farmers usually only act as price recipients so that their position in determining prices is often weak. Meanwhile, a larger role in controlling potato prices is usually determined by traders, ranging from collectors, wholesalers, to retailers. The existence of price fluctuations can affect the income of farmers and other potato business actors, therefore coordination and collaboration from potato marketing actors is needed in order to create effective and efficient marketing.
2. Based on the industry analysis, we concluded that:
 - a. Using Porter Five Forces model, we found that the competition among the existing industry is small to moderate, the threat of new entrants is small to moderate, the threat of substitutes is moderate, the bargaining power of suppliers is small to moderate, and the bargaining power of customers is high.
 - b. The result of the marketing mix can be seen in the figure of Business Model Canvas of Potato Indofarm.

3. The website design uses the methods of Unified Modeling Language (UML) and Eight Golden Rules Interface Design.
4. Based on the result of website design, the prototype of Potato Indofarm e-business is feasible to be implemented and realized.

Research limitation

1. His research is limited as it only discusses the website for the potato farmers at Dieng Plateau, Wonosobo, Central Java.
2. Further research related to this topic may explore and develop the concept and use of e-commerce in this research.

REFERENCES

- [1] Calopa, Marina Klacmer, Jelena, Horvat, and Maja Lalic. *Analysis of Financing Sources for Startup Companies 8th Edition*. South Western: Cengage Learning. 2014.
- [2] Chaffey, Dave. *E-Business and E-commerce Management, Strategy, Implementation and Practice*. 4. New York: Pearson Education Limited. 2009.
- [3] Chan, Elsie, and Paula M.C. Swatman. "Electronic Commerce: A Component Model." *3rd Annual COLLECTeR Conference on Electronic Commerce*. 1999.
- [4] Elias, Stephen, and Clare Noon. "The Growth and Development of the Indonesian Economy." *Bulletin December Quarter*. 2011.
- [5] Gunawardana, and D. Kennedy. "Relationship between Globalization and E-Commerce, International." *Journal of e-Education, e-Business, e-Management and e-Learning* 2 (1): 1-6. 2018.
- [6] Laudon, Kenneth C., and Carol Guercio Traver. *e-Commerce, Business, Techonology, Sociaty*. New York: Pearson Education Limited. 2014.
- [7] Nirwana, Michael Dwianto, and Wawan Dhewanto. "Barriers in Implementing the Lean Startup Methodology in Indonesia – Case Study of B2B Startup." *Procedia - Social and Behavioral Sciences* 23-30. 2014.
- [8] Osterwalder, Alexander, and Yves Pigneur. "An eBusiness Model Ontology for Modeling eBusiness." *eReality: Constructing the eEconomy Bled, Slovenia* 15: 1-12. 2002.
- [9] Pradana, Mahir. "Klasifikasi Jenis-jenis Bisnis E-Commerce di Indonesia." *Jurnal Neo-Bis* 9 (2): 33-40. 2015.
- [10] Putera, Andri Donnal. 2018. *Kompas*. <https://ekonomi.kompas.com/read/2018/05/07/113925626/bps-kuartal-i-2018-pertumbuhan-ekonomi-indonesia-506-persen>.
- [11] Sarjono, Sanny and Melati. "Supply Chain Design of Potato Commodity in Wonosobo Regency, Central Java – Indonesia." *International Journal of Engineering & Technology* 7 (4.4): 42-45. 2018.
- [12] Satzinger, John W., Robert B. Jackson, and Stephen D. Burd. *Systems Analysis and Design in A Changing World*. Boston: Cengage Learning. 2012.
- [13] Totonchi, Jalil, and Gholamreza Kakamanshadi. "Relationship between Globalization and E-Commerce." *International Journal of e-Education, e-Business, e-Management and e-Learning* 2 (1): 1-6. 2012.
- [14] Zheng, Weijun. "The Business Models of E-Marketplace." *Communications of the IIMA* 6 (4): 1-18. 2006.
- [15] Sarjono, *Peluang Ekspor Tanaman Kentang*, Ellunar, Bandung, 86. 2020. ISBN: 978-623-204-755-6.
- [16] Yasmin, A., Tasneem, S., & Fatema, K., Effectiness of Digital Marketing in the Challenging Age: An Empirical Study, *International Journal of Management Science and Business Adminstration*, 69 - 80. 2015.
- [17] Deni Apriadia, Arie Yandi Saputra, (2017), E-commerce berbasis Marketplace, dalam upaya mempersingkat Distribusi penjualan hasil pertanian, *Jurnal RESTI, (Rekayasa Sistem dan Teknologi Informasi)*, Vol. 1 No. 2 (2017) 131-136
- [18] Kotler & Armstrong. (2014). *Principle of Marketing*, 15th edition. New Jersey: Pearson Prentice Hall.