



Article Type: Research Paper

Bedukmawa: Marketplace and Fintech Design for Student Entrepreneurship in the Industrial Revolution 4.0 Era

Suryo Pratolo



AFFILIATION:

Department of Accounting
Universitas Muhammadiyah
Yogyakarta. Yogyakarta. Indonesia.

***CORRESPONDENCE:**

suryo@umy.ac.id

THIS ARTICLE IS AVAILABILE IN:

<http://journal.umy.ac.id/index.php/ai>

DOI: [10.18196/jai.2101141](https://doi.org/10.18196/jai.2101141)

CITATION:

Pratolo, S. (2020). Bedukmawa: Marketplace and Fintech Design for Student Entrepreneurship in the Industrial Revolution 4.0 Era. *Journal of Accounting and Investment*, 21(1), 125-144.

ARTICLE HISTORY

Received:

09 Sep 2019

Reviewed:

12 Oct 2019

Revised:

22 Dec 2019

Accepted:

29 Dec 2019

Abstract

Research Aims: The buying and selling system can no longer be manual instead it must be based on information technology so that it can be accepted by millennials and make them have a strong entrepreneurial spirit. For this reason, the movement of “Belabeli Produk Mahasiswa” (Bedukmawa) offers solutions to millennial generation the entrepreneurial challenges. Bedukmawa is an entrepreneurial movement based on demand-pull or pulling needs with incentives from the campus to encourage the buying movement by students to other students, so that with this transaction movement there will be a producing and selling movement naturally. The producing and marketing actions are the atmosphere that is raised on campus so that the university has a role in making it happen by providing stimulative funds for it. Bedukmutu is a web-based application that uses the concept of IoT (Internet of Things) that upholds convenience and public acceptance for millennial generation students. Hence, the purpose of this study is to obtain direction on entrepreneurship design on the campus that can encourage students to practice entrepreneurship effectively and efficiently in the era of the industrial revolution 4.0.

Design/Methodology/Approach: In evaluating the Bedukmawa operation, we involve some users to conduct Focus Group Discussion (FGD), they were academic community groups, namely the lecturer group and the university leadership group.

Research Findings: The results of applying this Bedukmawa application for a year at University Muhammadiyah Yogyakarta as an object of research produced an extraordinary output, in which the student entrepreneurship movement has reached billions of rupiahs monthly and with this application, IoT Big Data is presented, in which it provides various measurable information in multiple ways.

Theoretical contribution/Originality: This paper is an initial research that discusses how policies in creating a marketplace in campus using a web-based application can be integrated with entrepreneurial learning practices for students.

Practitioner/Policy implication: This paper provides a practical overview related to how the marketplace can be formed in a campus environment using a web-based application so that it can support students to learn entrepreneurship in a real way.

Research limitation/Implication: This paper only provides a framework based on one of private campus experiences in Indonesia. Replication of this policy on other campuses may require certain adjustments given the environment and culture of each campus is different.

Keywords: Entrepreneurship; Economic Sovereignty; Demand Pull; Internet of Thing; Bigdata; Bedukmawa

Introduction

Economic independence is a significant factor in the advancement of civilization in developed countries. Weak financial autonomy will make the vulnerable joints of the nation outside the economy, both the political, cultural, as well as defense and security joints. Therefore, financial sovereignty becomes a strategic issue. To realize the economic autonomy of the nation, we must first understand that the concept of economic independence covers three dimensions, namely self-sufficiency, self-discovery, and self-confidence (Mukeri, 2012).

The first dimension, which is self-sufficiency, is a dimension of feeling enough for what we already have. Self-sufficiency is also called qana'ah which means feeling satisfied and sufficient for the sustenance of Allah, and we are obliged to give thanks (Al-Kumayi, 2004). The second dimension, namely self-discovery, is an understanding of who we are and where we stand as Indonesian people. The third dimension, which is self-confidence, is the belief that we, as a nation, will be able to be independent, sit equally low, and stand tall together with the world community. Economic independence will be able to be upheld with these three pillars of dimensions where the people have a sense of self-sufficiency, able to find who they are, and have confidence (refer to Figure 1).

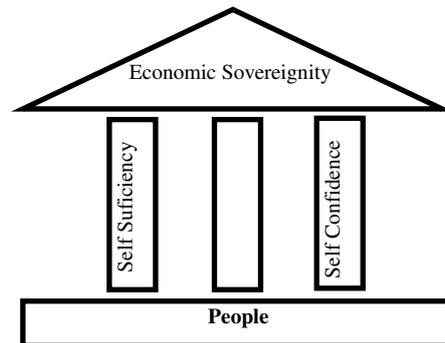


Figure 1 Nation's Economic Independence Building

Source: Formulated by Author

Figure 1 shows that national economic independence is our attitude as the people of Indonesia to always be grateful for what God has given us, fertile land, vast oceans with abundant fish, an excellent climate for agriculture and farm. Based on that fact, as a nation, we must have the confidence to prioritize our abilities in overcoming various economic problems to achieve one goal, without securing ourselves to the various possibilities of mutually beneficial cooperation with other countries. That is because we know who we are; we are a nation that likes to work hard and work together, helping each other enthusiastically and united by the teachings of the predecessors of this nation in the joint Pancasila. As proof that we are a nation that has confidence in the economy, the concept of the popular economy can provide economic defense during the financial crisis that hit the Indonesian economy. During the Indonesian economic crisis, it was the people who turned out to provide livelihoods and jobs for the

Indonesian people themselves. Cooperation in a society-based economy shows the gratitude shown by the Indonesian people according to the principle of self-sufficiency.

Indeed, realizing and maintaining economic independence requires a continuous learning process. People who are willing and continue to follow a good learning process will gradually gain power, strength, or ability to make the right decision to meet their needs independently. Sumodiningrat (2000) explains that community economic independence can be achieved through an empowerment process. With the empowerment of the community, the community members will be able to be independent and improve the standard of living of their families, as well as to optimize the resources they have.

To realize the independence of a society-based economy characterized by cooperation, takes a lot of entrepreneurs. At present, the ratio of Indonesian entrepreneurs is around 3.1% of the total population, or approximately 8.06 million people (Hartarto, 2018). Although the rate has exceeded international standards, which is 2%, it still needs to be improved. Singapore has now reached 7%, and Malaysia is at the level of 5%. According to Airlangga Hartarto, to become a developed country, the government needs to continue to spur entrepreneurial growth, including Small and Medium Industries, while increasing productivity and competitiveness in the digital era (Hartarto, 2018).

In line with what Hartarto (2018) said related to competitiveness in the digital age, the nation's economic independence faced challenges with the rapid development of information technology and gave rise to a wave of the industrial revolution 4.0 that we know with this industrial revolution led to economic disruption such as printing companies, taxis, television, and others. Another challenge is that the nation's young generation is millennial who cannot be separated from the device to access information through the world, data is always in the hands of today's young generation, and with this information technology access to the needs of goods and services cannot be limited by the area of a country. The conditions of the industrial revolution 4.0 and the requirements of this millennial child must be understood by us so that threats can become opportunities and be able to increase the economic independence of the nation.

Unlike other empirical research that departs from the practical and experiential gap, this research is based on the experience of a private campus in increasing its economic independence by exploiting the market potential on campus. The stimulus for creating this market is conducted by launching online buying and selling applications among students, which we call "Bela Beli Produk Mahasiswa (Bedukmawa)". As one of the components of the nation, students are one of the backbones of the nation's progress in the future, and the campus is a vehicle for pasting students as a formidable future generation. In addition to academic skills and knowledge that must be mastered by students, the entrepreneurial spirit must also be the main thing as capital to advance the nation through economic security. The financial resilience of the Indonesian people is a prerequisite for the creation of independent economic sovereignty that is not dependent and depressed by other nations' economies. There are several challenges in

the realization of financial independence. First, entrepreneurship education on campus at this time is considered not able to provide a provision of skills and understanding of entrepreneurial practices for students because they are still classical. Second, the current industrial revolution 4.0 has felt its impact on the domestic business world. Third, the millennial generation, which will become the successor of the nation in almost no time, cannot be separated from technology and information systems so that the business platform has shifted from manual to automation.

Literature Review and Focus of Study

Indonesia Economic Condition

It is predicted that the Indonesian economy will still face challenges. Apart from economic stability in 2018, there were several problems in 2019. Within the internal scope, it would appear that there would be the following conditions: a. current account deficit, b. the high import, c. competitiveness, d. labor issues, and e. the rolling of the industrial revolution era 4.0 (Indonesian Ministry of Economy, 2019). On the external side, the main challenges stem from the risk of weak global economic growth and falling commodity prices. The real domestic challenges are a. food, energy, and water security; b. Industry, maritime, and tourism competitiveness; c. long-term financing; and d. inclusive economy. Besides, the necessary capital for development and macroeconomic and financial system stability needs to be strengthened.

For this reason, the policy mix aims at safeguarding stability, driving economic growth momentum, and accelerating structural reform. It is expected that Indonesia's financial structure will be more diversified and support sustainable economic growth. From the domestic side, the strengthening of the national economy still faces several structural problems. First, the challenges of achieving food, energy, and water security as input are the main factors in supporting the transformation process towards industrialization. Second, Indonesia is still lagging in the global value chain compared to competing countries in the region, where the imbalance of industrial structure and low productivity causes the competitiveness of Indonesian industrial products to be relatively weak. Third, strengthening the basis of long-term sustainable financing to support investment as the foundation of the economic driver. Fourth, creating equity for the community to participate in and benefit from development and economic growth.

Disruption and the Industrial Revolution

As elaborated earlier, economic independence faces disruption over the existence of the industrial revolution 4.0. The industrial revolution 4.0 mainly resulted in the phenomenon of economic sharing and extensive use of the internet of things in all fields and sectors of life. Business competition is no longer between products in similar industries, but between business models in industries whose boundaries are increasingly blurred. This phenomenon, at the same time, raises a threat to organizations that are still shackled by old conventional rules that are not familiar with smartphones,

technological applications, statistical analytics, and big data. Disruption is not only caused by a change in the "way" of doing business but also it is business fundamentals. Starting from the cost structure to culture, and even industrial ideology. Economic sharing, according to Khasali (2017), is where disruption occurs due to changes in ways of doing business, which used to emphasize owning (ownership) to sharing (sharing roles, collaboration resources). In the past, everything was controlled independently. Now, if possible, sharing functions, or else, if everything used to be done unaided, in this disruption era, we collaborate and cooperate. Disruption changes things in such a way that old business methods are obsolete or obsolete.

Discussing disruption cannot be separated from the stage of the industrial revolution, which at this stage has reached the industrial revolution stage 4. The effects of the next disruption are better understood when discovering what happened to the industrial revolution itself. The industrial revolution means a significant and radical change in the way humans produce goods and services. The industrial revolution 1.0 began with the discovery and use of steam engines in the process of producing goods. Before the existence of steam engines, humans relied on muscle power, hydropower, and wind power to drive tools. There are problems faced because of the weakness of the source of energy. For example, humans, horses, cows, and other muscular forces cannot possibly lift weighty items, even with the help of a pulley. It takes regular breaks to recover the power, so does the production process; if you want to run for 24 hours a day, it requires more energy. In addition to muscle, waterpower and wind power are often used. The main problem with these two power sources is that we cannot use them anywhere. The invention of a steam engine that is far more efficient and cheaper no longer limits the time to drive the motor. This industrial revolution made Europeans send their warships to all corners of the world in a much shorter time. Because engine power is now not limited by muscle, wind, and waterfalls, there have been tremendous cost savings in production, transportation, and even military. The goods produced are far more, cheaper, and easier to obtain. The money that was initially used to produce and buy expensive goods can now be used for other things so that products that are not produced using a steam engine become even more salable. This industrial revolution also changed the world community, from an agrarian society where the majority of the people worked as farmers, to an industrial society.

The 2.0 industrial revolution took place in the early 20th century. At that time, production was already using machines, and steam power was replaced by electricity. The revolution occurred by creating a "Production Line" or Assembly Line that uses a "Conveyor Belt" or conveyor belt with the help of tools that use electric power, which is much easier and cheaper than steam power.

The industrial revolution 3.0 The industrial age of 3.0 was slowly replaced by the information age. If a steam engine triggered the first revolution, a conveyor belt and electricity triggered the second revolution, whereas a moving machine triggered the third revolution, by which it thinks automatically: computers and robots. The progress of speeding computer technology embarked remarkably after the second world war is over. The discovery of semiconductors, followed by transistors, then integrated chips

(ICs) made the size of the computer smaller, less electricity needed, while the ability to count flew to the sky. Reducing the size of the computer becomes essential because now it can be installed on the machines that operate the production line. Nowadays, computers replace many people as operators and controllers of production lines, just as telephone operators in telephone companies are replaced by relays so that we just need to dial phone numbers to contact our friends.

Along with the progress of the computer, the development of machines that can be controlled by the processor also increased. All kinds of machines are created with forms and functions that resemble a human. The computer becomes his brain, the robot becomes his hand, slowly the role of manual labor and manual labor disappears. Because of this progress, too, there was a change from analog data to digital data, such as from recording music using a cassette to a CD, from watching movies on a video player to a DVD player, etc. It happens because the computer can only work with digital data as a result of the third industrial revolution or known as the "Digital revolution". This revolution also makes video games become something usual in our lives, and they become a business with billions of values, even trillions of dollars.

The 4.0 industrial revolution bases on computer and robot technology as its platform, which further produces four things, namely: First, the progress of the internet where all computers are connected to a shared network, and the size of computers can be smaller. Computers are always connected to giant networks and produce the Internet of Things when they are connected to the internet. Second, technological advances can create sensor technology that can record events at any time and provide so many variations and the amount of new data and become Big Data. Third, related to the first and second is Cloud Computing. Complicated calculations still require large, sophisticated computers, but because they are connected to the internet, because there is a lot of data that can be sent via the internet, all these calculations can be done elsewhere, rather than an in-home base. So, a company that has five offices in five different countries only needs to buy a supercomputer to process the necessary data simultaneously for the five office business activities in each country, which no longer need to buy five supercomputers to do it separately. Fourth, the discovery of Machine learning, which is a machine that can learn, which can realize that he made a mistake so that he made the right correction to improve subsequent results. Combining these four things means that supercomputers can do calculations that are complex, extraordinary, and unthinkable about anything with capabilities beyond the limits of human ability.

Student Entrepreneurship

Another thing that is important to note related to the need for economic independence is the high number of educated unemployed. From the perspective of tertiary institutions, this condition must be the basis for the need to change orientation in providing entrepreneurial skills and experience for students. The facts show that the majority of tertiary graduates are still oriented as job seekers rather than as job creators. The learning system in various universities focuses on how to prepare the students to graduate and get a job immediately, in which in a university accreditation

the duration of studying of graduation and waiting time for work become some indicators of the university success rather than graduates who are ready to create the kind of work. According to Hisrich and Peters (1992), entrepreneurship includes a series of behaviors, skills, and traits that support the development of innovation and creativity. University graduates synonymous with knowledge must have the ability to prosper themselves and their environment. Therefore, the tertiary education system in Indonesia must focus more on preparing graduates to be able to live independently, be creative, utilize science and technology, and the arts they have mastered. At present, the entrepreneurship education that is packaged through traditional learning methods, teaching staff, literature review and written evaluation is not enough to be able to activate the entrepreneurial spirit for its graduates. Entrepreneurship education focuses on humans holistically (including their knowledge, feelings, values, and interests) so that they can think creatively and innovatively.

According to Presidential Instruction No. 4 of 1995, entrepreneurship is defined as the spirit, behavior, and ability of a person in handling businesses and or activities that lead to efforts to find, create, implement new ways of working, technology and products by increasing efficiency to obtain better service, and or greater profits. Entrepreneurship can occur in all fields (Hodgetts & Kuratko, 2001), the arena of entrepreneurship in principle is how to change economic resources from areas with low productivity and yields to areas with higher productivity and with greater results. Entrepreneurs in the fields of health, education, and business basically work the same way, they work better, they do it differently from others (Drucker, 2014).

Outputs that can be generated by entrepreneurs include the creation of wealth, enterprise, innovation, change, employment, value and growth (Morris, Lewis and Sexton, 1994). Through the ability to produce these outputs, a person can be called an entrepreneur in any field. For example, a business entrepreneur is required to be able to create prosperity, enterprise, innovation, employment, value and growth, while a corporate entrepreneur (intrapreneur) should have the ability to create innovation, change, and value that will indirectly foster prosperity, company, innovation, employment, value and growth for the organization where he works.

Susilaningsih (2015) has examined and compared the practice of higher education entrepreneurship education programs abroad, namely in Singapore, China and Finland. Of the three shows different models that we can good aspects of it. In Singapore, Nationa University of Singapore (NUS) started entrepreneurship education by instilling an entrepreneurial mental attitude and then continued with innovation and creativity activities that were applied to a study, with the target of research results in the form of products that could be commercialized. With this model, it can finally produce entrepreneurs in the academic field (academic entrepreneurs), entrepreneurs in the social field (social entrepreneurs) and at the same time entrepreneurs in the business sector (business entrepreneurs) based on research and technology.

In China, entrepreneurship education is focused on forming business entrepreneurs. The government and parents of students are involved in entrepreneurship education in

tertiary institutions. The role of the government is to provide business plan competition programs, provide business incubation at each tertiary institution and in the city and province, as well as provide initial capital and provide incentives to entrepreneurial students in the form of tax reductions and other financial support. The role of student parents is to provide financial assistance, share business and network experiences.

In Finland, Turku University encourages its students to become corporate entrepreneurs in their entrepreneurship education. Students are given training through several stages, starting from the triggering stage, providing knowledge about entrepreneurship to the stage of entrepreneurial behavior skills. Students are prepared to be able to work in a corporation to become employees who behave in an entrepreneurial manner. With this method, students are prepared to become corporate entrepreneurs or intrapreneurs as well as entrepreneurs. Entrepreneurship education begins with the formation of the mindset of entrepreneurship followed by the formation of creative and innovative behavior in order to be creative.

Information Technology and The Usefulness

According to McKeown (2001) Information Technology (IT) refers to all forms of technology used to create, store, change, and use information in all its forms. Williams and Sawyer (2007) define IT as a general form that describe any technology that helps produce, manipulate, store, communicate and or convey information. Information Technology is a combination of computer technology (hardware and software) to process and store information with communication technology to transmit information (Tanner, 2007). Computer technology and communication technology work together to form a system called information technology. In the 4.0 industrial revolution era, the development of information technology is growing rapidly so that it can provide benefits for all people. In more detail, the development of these technologies can have an impact on improving the efficiency of living standards for both individual and group. We can feel directly the technological developments in our activities on daily basis, starting from the ease of information access through the ease of energy and time which results in the increased results we get from our efforts. In other words, less effort, more results, because of the benefits of the information technology easiness in this the 4.0 industrial revolution era.

In this article, information technology is implemented to support the student entrepreneurship movement called "Bela Beli Produk Mahasiswa (Bedukmawa)" which have education and economic aspects. In the field of education, the use of information technology has greatly impacted people's lives. This is proved by the inclusion of digital education on campus and school, which is a good thing, because all students and students can get knowledge from anywhere else and are not constrained by face-to-face by educators. Learning can be done anywhere and anytime to improve the quality of knowledge gained by learners. It also offers convenience for the students is that it can save costs when implementing the practicality of this information technology to the maximum, for example the students can access books and journals over the internet for free without having to pay as usually incurred when buying books physically. In the

economic field, economic independence can be increased in line with technological developments. Technological developments can certainly have an impact both in the economic and investment industry aspects. As an example, Bedukmawa applies the development of E-Commerce. E-Commerce Innovation allows all elements of trading activities (i.e. producers, agents, and consumers) to benefit. The intended benefits are not necessarily material benefits, but rather time and energy. For example, if a company wants to sell its products using the E-Commerce system, the buyer does not have to come to the store to buy the item. Therefore, the time and energy of the seller and the buyer has been reduced compared to using conventional methods, in which the seller must open a physical store and the buyer must physically come to the store. Another application in economics is the presence of an online wallet so that the users do not have to carry money physically, instead it has been replaced virtually. The positive impact on security is that it is safer because the money they have is systematic and far more difficult to steal. The core impact obtained in this economic field is the level of productivity which is getting higher due to the ease of buying and selling transactions.

The rapid development of information technology can no longer be avoided in any aspects, especially in education and the economic. It is demanded are that the community can always adapt and maximize the situation towards the efforts to improve the quality of education in economics.

Fintech

FinTech, in general and in a broad sense, is interpreted as a form of using technology to provide financial solutions (Arner, Barberis, & Buckley, 2015). Specifically, FinTech is defined as the application of digital technology to carry out financial intermediary functions (Aaron, Rivadeneyra, & Sohal, 2017). Broadly speaking, FinTech is as an industry that uses technology to make financial systems and financial service delivery more efficient. As an innovation, FinTech is a technological innovation in financial services that can produce business models, applications, processes or products related to the provision of financial services. The usual financial services provided through FinTech are classified into several forms including (Triantono & Aryusmar, 2019):

1. Payment, transfer, clearing, and settlement which are closely related to mobile payments (both by banks or non-bank financial institutions), electronic wallet (digital wallet), digital currencies (digital currencies) and use of distributed ledger technology (DLT) for payment infrastructure.
2. Deposits, loans and additional capital The most common FinTech innovations in this field are online crowdfunding and P2P (peer-to-peer) lending platforms, digital currencies and DLT. This application is closely related to financial intermediation.

Marketplace

Marketplace literally means a medium for transactions or virtual markets. If the conventional market requires a physical market as a place for sellers and buyers to meet, then in a virtual marketplace, media is the place for doing transactions.

Marketplace is an online business transaction platform providing digital methods to facilitate commercial transactions such as selling goods, services or information online between buyers and sellers (Alrubaiee, Alshaibi, & Al-bayati, 2012).

The era of the Industrial Revolution 4.0 is currently shown by the development of information technology infrastructure, the enhancement of the internet, and the increase of smartphone users who can operate various applications to facilitate activities. This marketplace is designed to minimize complex business processes to produce efficient and effective business processes. With this Marketplace, anyone can carry out buying and selling activities easily, quickly and economically because there are no limits on space, distance and time. Besides, the system of transaction do not need to do regular maintenance because it has been handled by the marketplace provider so that it can cut operational costs (Apriadi & Saputra, 2017).

Using marketplace media, the businesses have automatically being promoted in the marketplace site because its engine contains big data supported by reliable marketing strategy features. Hence, what needs to be done in running a business in a marketplace site is to provide complete product information about the products it offers. With various benefits available in the marketplace, businesspeople can cut transaction costs, retain customers and get new customers, as well as create efficiency.

The system of buying and selling transactions using the marketplace is done online using devices such as mobile phones, laptops, or other telecommunications equipment. With an information technology base, the marketplace can produce big data that can show business segmentation, products with the most interest, and the ease of finding information on products or services. With the marketplace, transaction coverage is very broad, which is able to support business to business, business to customer, and customer to customer economic activities (Pradana, 2015).

The flow of transactions using the marketplace involves two stages, the first, by using internet-connected devices, prospective consumers surf the marketplace just to look at information on the latest products displayed digitally in the form of images, videos, and text. Secondly, prospective consumers look deeper into data and information on products for the sale and purchase transaction process. If prospective customers are interested in the products available in the marketplace, they can place an order on the electronic message order feature. Furthermore, orders that have been stored in the marketplace system will be followed up by merchants, who will send products that have been ordered to consumers. Merchants who sell products physically, will send it by courier to the destination address of delivery. The pattern of transactions through the marketplace can be illustrated in Figure 2.

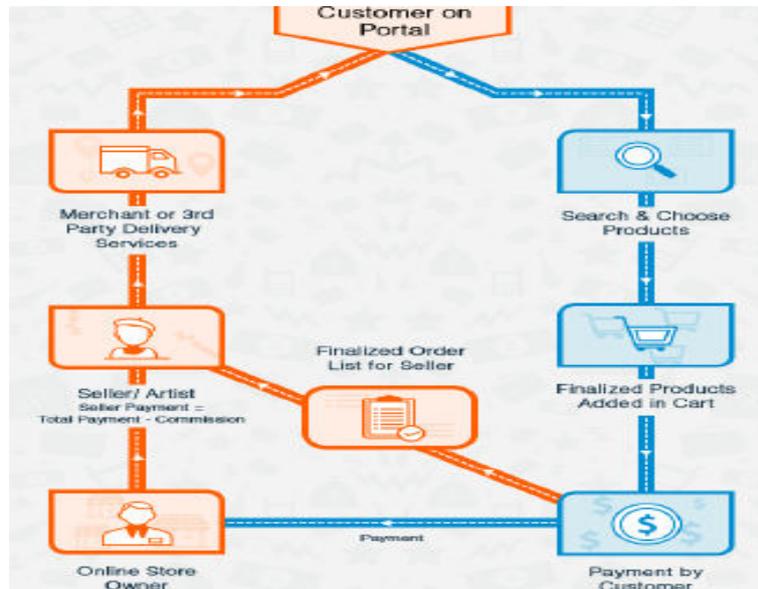


Figure 2 Marketplace Business Process Flow

Source: Yustiani and Yunanto (2017)

Research Method

Based on the literature on the importance of entrepreneurial skills for the students and how information technology is able to support aspects of education and economic independence, then to build students' economic independence designed at the Muhammadiyah University of Yogyakarta, the method used is the Focus Groups Discussion (FGD) method. The FGD was conducted with several academic community groups, namely the lecturer group and the university leadership group. The results of the FGD with lecturers and university leaders continued with the FGD with designers and application developers. The points discussed at the FGD with lecturers and students include:

1. How important is the provision of entrepreneurial spirit for students?
2. Are the methods of providing students' entrepreneurship so far appropriate?
3. What kind of alternative methods for equipping students?
4. What role does information technology play in the industrial revolution 4.0 era in student entrepreneurship?
5. What kind of learning design needs for millennials?
6. What kind of student entrepreneurship learning model supported by information technology for millennial generation?

The results of the FGD with lecturers and university leaders were concluded that:

1. The preparation of entrepreneurship is important to produce graduates who can independently support and solve the nation's problems in terms of economic independence as described previously.
2. The classical method that has been applied to provide students with entrepreneurial spirit is less effective because it is new to the cognitive aspect, and it has not touched the affective and psychomotor aspects.
3. The preparation of entrepreneurship must be able to provide a psychomotor aspect, meaning that students must be able to feel how independent they are shown by their ability to produce products and / or market products or services created by students.
4. Web-based information technology is needed as an instrument for students to market their products and to be an atmosphere for students to buy their friends' products.
5. Learning design for millennial children is not classical but relates to a device so learning is not constrained by time and place.
6. It takes a marketplace application as a means for students to market a product or service, and as an instrument for students to buy the products of other fellow students.

Based on the FGD with lecturers and university leaders, the concept of demand-pull movement is produced, where universities create an entrepreneurial atmosphere through the creation of shopping needs of students and are fulfilled by students themselves called Bedukmawa movements, namely the student product label. Then a system of FGD is conducted with the application developer, the result is the Bedukmawa marketplace application that is explained in point D.2

Result and Discussion

Bedukmawa Design

Manual Design

Bedukmawa stands for Belabeli Produk Mahasiswa/ Defend-purchase Student Product. Belabeli is an entrepreneurial movement for students carried out at Yogyakarta Muhammadiyah University using the concept of mutual cooperation and demand pull. This concept principally concerns on how to raise the spirit of mutual cooperation and entrepreneurship by making a movement of buying products produced by fellow students. With the buying movement, there will be a pull of needs that will eventually lead to the movement of producing and selling from other friends. This concept will provide an atmosphere for the students of healthy competition in and mutual assistance as well as enhance the entrepreneurial success of other friends. The Bedukmawa movement has created an entrepreneurial environment for the students, they can sharpen their entrepreneurial spirit not only in the cognitive, but also affective, and psychomotor aspects. The mechanism of the drum system can be described manually as shown in Figure 3.

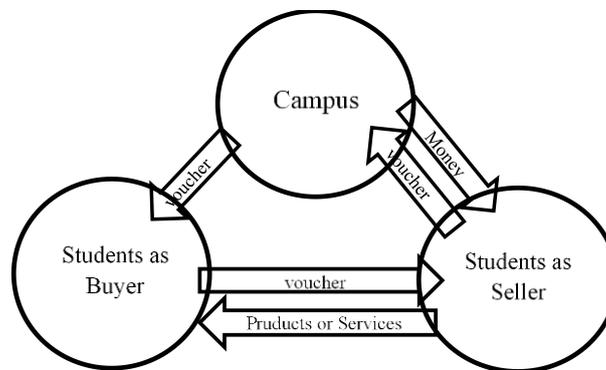


Figure 3 Bedukmawa Basic Concept

According to Figure 3, to create the student entrepreneurship atmosphere, the campus provides vouchers to students with a certain rupiah value. This is a form of campus concern for the skills and knowledge of students to drive this drum system. The voucher is given every month with a certain value, which can only be spent to buy the products produced by fellow students or other students, it cannot be used to buy the student's own products and services. The voucher given has a certain time limit, in which it is valid until is at the end of each month periode. The vouchers will be expired because the new vouchers will be filled in the next new month. If there is a transaction between a student as a buyer and as a student as a seller, then there will be a transfer of the voucher from the buyer's account to the seller's account and followed by the transfer of goods from the seller to the buyer. Vouchers that have been received by the seller from the results of selling to his/her fellow students will be delivered to the university's Bedukmawa admin and he/she will receive money according to the price of his/her sales.

As an illustration, it is assumed that the number of students at Universitas Muhammadiyah Yogyakarta is 20.000 and the voucher given to students is IDR 50,000 per month, then every month the amount of vouchers given by the campus and owned by students is IDR 1,000,000,000 (one billion rupiah). With this large amount of money each month it is expected that it will attract the students to sell their products to get the vouchers available per month by producing and offering their products or services. For student buyers, because there is a time limit of vouchers, then they will immediately spend the vouchers to avoid the expiration. Secondly, the motivation between the student sellers to spend their vouchers and the student buyers to sell their products in order to attract vouchers from student buyers makes the emergence of an entrepreneurial atmosphere and encouraging the climate of competition for student entrepreneurship. Furthermore, if the student's selling has received a nominal voucher from the student buyer, then the voucher from the sale can be redeemed or cashed into the university's Bedukmawa admin. Besides that, the students will get entrepreneurial experience and money at the same time. When the students keep being involved in this kind of transaction every month until they graduate, they will have active account.

Web-Based Bedukmawa Application

The next step is to finalize the Bedukmawa movement that meets the needs of millennials and creates a commercial revolution 4.0, then a marketplace, also called Bedukmawa, is designed and developed. The results of the FGD with the system developer concluded that the design of this marketplace was able to bring up the vehicles for transactions using vouchers or in cash, and was able to rank products and services that had good quality. This marketplace application is designed to produce big data that can provide information on student success in entrepreneurship and is the basis for coaching and encouraging those whose abilities are not yet standardized. The results of the Bedukmawa marketplace requires a lot of features and some procedures can be explained as follows.

The first step, the students create a personal account at Bedukmawa website. Making a Bedukmawa account requires a student ID number so that the recapitulation of a student-based entrepreneurial performance information can be generated. Student's email address becomes an important part in this application because it will be used as a medium of information for sending both transaction and payment notifications. After the students have an account, they get facilities both as a seller and a buyer. As sellers, the students can upload their products, while as buyers, they get facilities in the form of Bedukmawa vouchers. If a student wants to enter his account, he must fill in the username and password that has been set previously (refer to Figure 4).

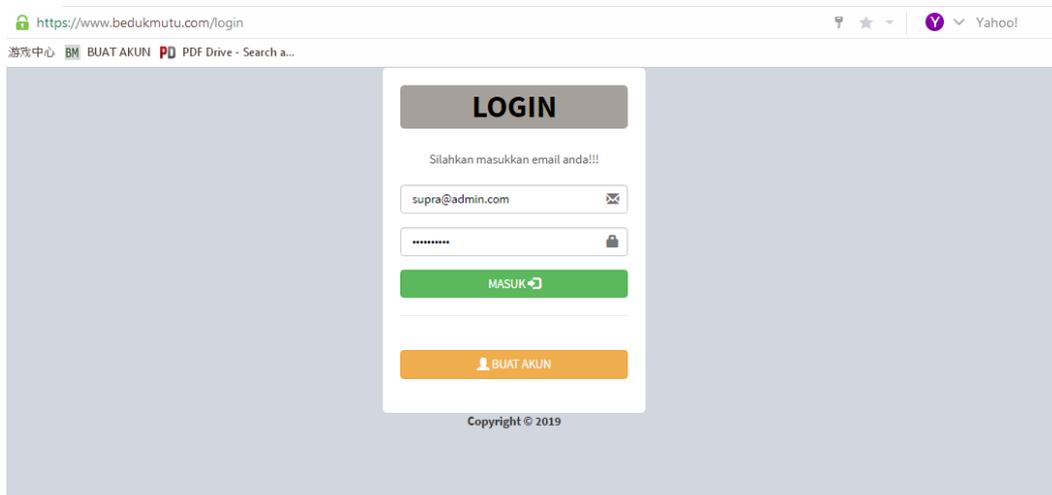


Figure 4 Login Feature of Bedukmawa

As the account owner, the students get two kinds of wallet vouchers, as a buyer and as a seller. The voucher contains the value of the voucher used to order a product to the seller where the voucher can only be used to order fellow student products and may not use to order the student's own product. The 3rd and 4th wallet vouchers are for students as sellers, where wallet 3 is for storing vouchers that have been completed in which the goods have been received by buyers who place orders with payment through

Pratolo

Bedukmawa: Marketplace and Fintech Design for Student Entrepreneurship...

vouchers. The 3rd voucher wallet is used to accommodate the voucher withdrawal proposal which will eventually be cashed or cashed to the campus through the campus admin, and the money has been received by the selling student, the 4th wallet voucher will be emptied, indicating that the transaction is complete or complete. Figure 5 shows the Voucher Wallet of Bedukmutu screen.

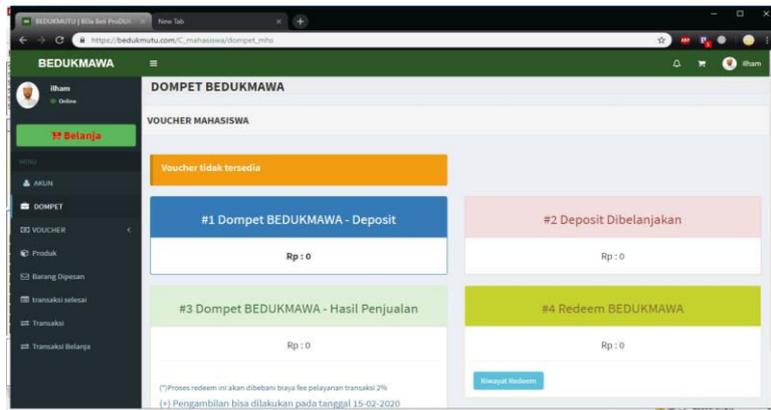


Figure 5 Voucher Wallet of Bedukmutu

In detail, the following will be explained about the mechanism of transactions between students in Bedukmawa. To make purchases, students as buyers use shopping features in the Bedukmawa marketplace system. By clicking on the shopping button, the buyer will enter the list of products sold by fellow merchants on campus. From the list of products the buyer can order the desired product by clicking on the product in question which will then appear the seller's identity, product description, and the desired payment mechanism, can be cash or use a voucher. If you use a voucher given by the campus, then payment can be clicked via the voucher and will reduce the nominal balance of the voucher when clicked agree to order the product. At that time the system will send a notification to the seller's account and also by the seller's email that there is a product order by the buyer, and at that time the voucher in the buyer's 1st wallet moves the order's nominal value to the buyer's 2nd wallet.

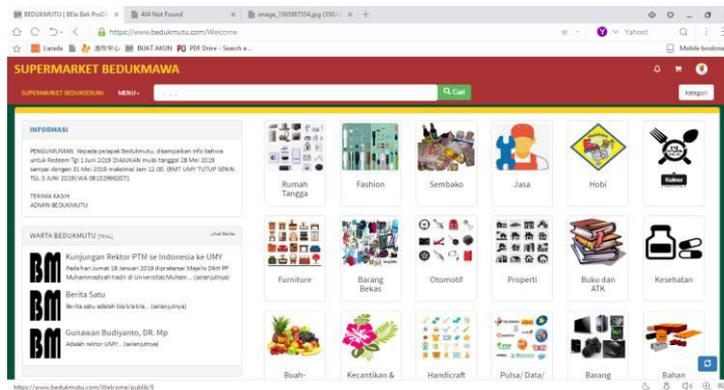


Figure 6 Product Cluster Shopping Feature of Bedukmawa

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Figure 6 shows the feature of products choice that can be selected by the student buyer. The products were upload by the seller student. It contains information about the appearance of the product, price and quantity available. The detail is shown in Figure 7.

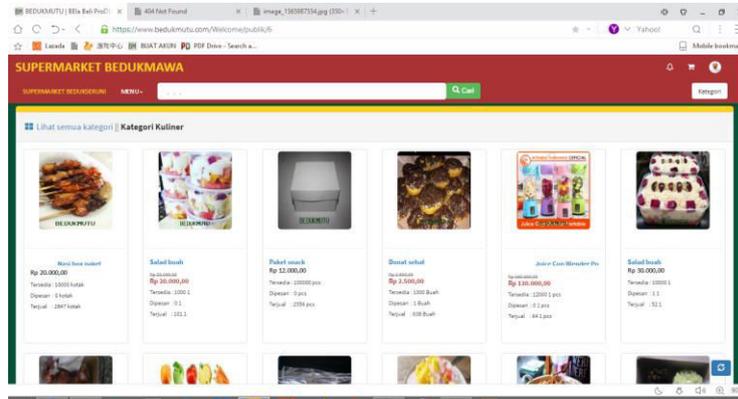


Figure 7 Product List Feature of Bedukmawa

Figure 7 shows the product in the culinary category. If one product is selected, then the detail picture will appear (refer to Figure 8).

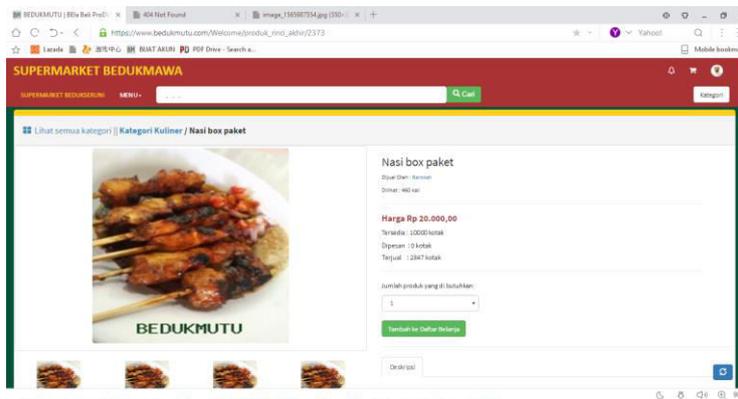


Figure 8 Product Booking Feature of Bedukmawa

Figure 8 shows one product example, satay, whose information includes price, product availability and seller's information. To place an order, click the “add shopping” list button, and the buyer student will fill in the identity and shipping address for delivery as shown in Figure 9. Figure 10 shows the payment process using a student voucher.

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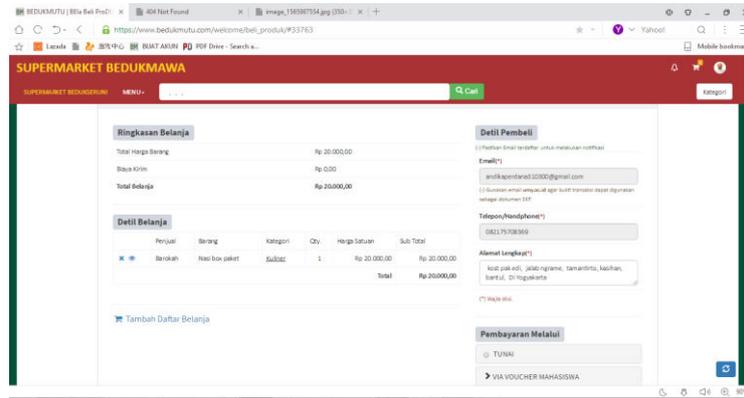


Figure 9 Booking Process Feature of Bedukmawa

After the seller receives a notification both in his Bedukmawa account and in his email, he completes the transaction by sending the item to the buyer and clicking on the symbol completed on the item features ordered on the seller's student account. At this time, the buyer's voucher in the buyer's 2nd wallet will move to the seller's 3rd wallet. This stage is the final stage of the Bedukmawa transaction process between the seller and the buyer.

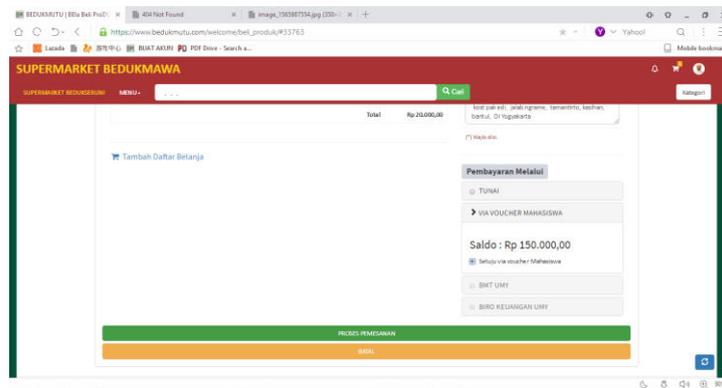


Figure 10 Payment Feature of Bedukmawa

At each period, sellers who have a balance in their 3rd voucher wallet can disburse physical funds to the campus admin by clicking the redeem button and filling in the nominal voucher to be cashed into physical funds so that the nominal from the 3rd voucher wallet will move to the 4th wallet. When the 4th voucher wallet is filled with the number for the voucher redemption, the university admin will get a notification and prepare the funds to be taken by the seller who has clicked the redeem button at the specified time. When the campus admin in Bedukmawa gives money to the seller as a result of redeem, then he clicks on the redeem feature on the campus admin account which leads to emptying the nominal balance on the 4th voucher wallet from the seller's student account. These stages indicate that the transaction cycle from

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product order, product delivery, product payment, to the disbursement of the results of product sales in the Bedukmawa marketplace has been completed.

Bedukmawa Movements Result

The results of applying Bedukmawa for two years show relatively good outcomes in terms of the realization of an entrepreneurial and financial atmosphere for students. It is proved from the average turnover of transactions between students for a year is around one billion. For example, in February 2019, the transaction that occurred was Rp. 1,100,892,205 and the data include the students who are actively selling products and those who are actively buying the products from their friends (refer to Figure 11).

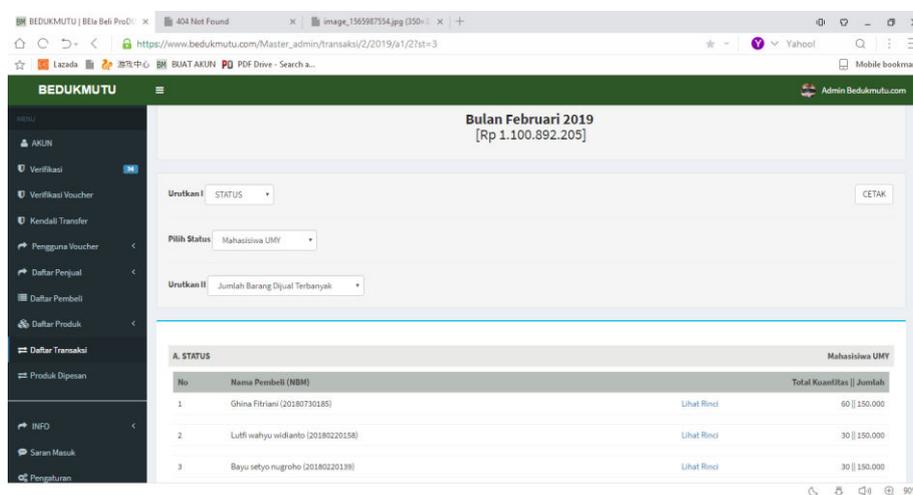


Figure 11 Financial Result of Bedukmawa at February 2019

These results revealed that students have carried out an entrepreneurial movement, from choosing products to sell, packaging for photographs, determining the cost of goods and selling prices, and uploading products on the official portal of the campus. Moreover, the big data generated data information about the type of product, students who actively produce products, students with best-selling products, and others. From the buyer side, information can be obtained about the products that are mostly demanded by the students as buyers, what types of products are of interest based on time, the price range of interest, and others.

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No	Nama Pembeli (NBM)	Total Kuantitas	Jumlah						
1	Ghina Fitriani (20180730185)	60	150.000						
Lihat Rinci									
No	Nama Penjual	Produk	Kuantitas	Harga Satuan	Jumlah	Tanggal Pesan	Tanggal Selesai	Pembayaran	Status (NIP/NIM)
a.	Emi Nur	Donat sehat	60	2.500	150.000	17-02-2019 08:32:32	17-02-2019 09:55:41	VOUCHER	Mahasiswa UMY (20160410443)
2	Lutfi wahyu widanto (20180220158)		30	150.000					
Lihat Rinci									
No	Nama Penjual	Produk	Kuantitas	Harga Satuan	Jumlah	Tanggal Pesan	Tanggal Selesai	Pembayaran	Status (NIP/NIM)
a.	Muhammad Akbar Priambodo	pin tutup botol	30	5.000	150.000	28-02-2019 22:57:26	28-02-2019 23:45:09	VOUCHER	Mahasiswa UMY (20180220136)
3	Bayu setyo nugroho (20180220139)		30	150.000					
Lihat Rinci									
No	Nama Penjual	Produk	Kuantitas	Harga Satuan	Jumlah	Tanggal Pesan	Tanggal Selesai	Pembayaran	Status (NIP/NIM)
a.	Muhammad Akbar Priambodo	pin tutup botol	30	5.000	150.000	28-02-2019 19:09:55	28-02-2019 20:15:31	VOUCHER	Mahasiswa UMY (20180220136)

Figure 12 Bigdata of Students transaction Activity

Conclusion

The independence of the nation's economy is part of the nation's sovereignty, which is the responsibility of all levels of society including the academic world in higher education because it consists of lecturers and students who are advanced generations in terms of thinking and acting. The campus must be able to become a pillar that provides solutions to the nation's problems at this time which is still lacking in terms of the number of entrepreneurs. The low number of entrepreneurs will greatly affect the nation's sovereignty, especially its economic autonomy. Another challenge that arises is that the campus as a vehicle for higher education has not been able to produce graduates who have a significant entrepreneurial spirit. The campus curriculum in Indonesia must be improved continuously, especially in facing the era of the industrial revolution 4.0 and millennial generation where campus management is still held by the old generation. Based on observations and results of research conducted, the Bedukmawa movement drives the purchasing power of students produces a massive selling movement where the selling movement begins with the producing movement. The Bedukmawa movement is effective when it is supported by adequate information technology so that the millennial generation feels comfortable to develop and carry out their entrepreneurial activities and become a formidable generation of future entrepreneurs.

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