

The Influence of Independent Campus Activities on the Interest of Informatics Students to Establish Startups in Their Regions

Abstract— University usually pursues three main objectives: technology transfer, promotion of entrepreneurship, and commercialization of research. The other goal is to maintain an entrepreneurial spirit, responsibility and financial support. Research based company technology (startups) is becoming increasingly important in today's competitive economy. Higher education can connect human resource needs, talents, technology, capital, and knowledge to foster an entrepreneurial spirit, accelerate Startup development and reduce unemployed university graduates. There are many opportunities for the Faculty of Engineering students, especially the Informatics Program to build a Startup to help MSMEs. With the spirit of the Merdeka campus, the entrepreneurship program has 4 excellent activities, namely 1) Entrepreneurship Workshop, 2) Indonesian Student Management Business Activities (KBMI) 3) Acceleration of Indonesian Student Startup (ASMI) and 4) attached Mentoring by practitioners/entrepreneurs and lecturers. KBMI is intended for students who need to stimulate business development funds and ASMI is intended for students who have digital startups and need a place to accelerate their business to an advanced stage. This research discusses what variables affect the selection of a startup so that it can receive financial assistance and coaching support from the campus. The respondents are 162 informatics students. The method used is distributing questionnaires through Google forms and assessing the products presented, demonstrated and produced by students. From the results of the study, it was found that several game applications, e-commerce, IoT, web designers and e-learning were the startups that were most chosen by Informatics students.

Keywords— startups; informatics students; independent campus; entrepreneurship; university

I. INTRODUCTION (*HEADING 1*)

startup is a new business that is growing fast and growing rapidly and aims to meet market needs, by developing business models around innovative products, services, processes, or platforms. Startups are typically companies designed to effectively develop and validate scalable business models. The core of startups is related to the concepts of ambition, innovation, scalability, and growth. Usually, startups offer products/services that are not currently offered or are not well known in the market. At the beginning of the formation of a startup, usually the expenses are greater than the income. Most startup companies are usually sponsored by other people, other companies, or bank loans. The most important attribute in a startup is its ability to grow [1].

After COVID-19 hit all countries around the world, human activities changed a lot. All activities related to public services are carried out online, work from home, study from home, and shop from home. Including sales of meat products, fish, seafood, chicken, vegetables and fruits can be ordered from home, and will be delivered directly to the house fresh and guaranteed quality, without having to bother going to the market anymore [2-5]. This opens new business and job opportunities for students who graduate from the Faculty of Engineering, especially Informatics to help people in their respective areas. In addition to helping local small and medium enterprises (SMEs) and Local Government, students will also have the opportunity to have a digital economy and startup.

Ministry of Education and Culture through the Directorate Learning and Student Affairs, the Directorate General of Higher Education continues to develop and increase the number of entrepreneurial students. One of them

is by organizing the Independent Campus Entrepreneurship Program 2020. With the spirit of the Merdeka campus, the entrepreneurship program has 4 excellent activities, namely Entrepreneurship Workshop, Indonesian Student Management Business Activities (KBMI), Acceleration of Indonesian Student Startup (ASMI) and attached Mentoring by practitioners/entrepreneurs and lecturers. KBMI is intended for students who need to stimulate business development funds and ASMI is intended for students who have digital startups and need a place to accelerate their business to an advanced stage [6]. From the startup database recorded, 100% were founded by Indonesians, 36% is dominated by the e-Commerce sector, 5% fintech, 2% game startups and 55% other fields. Startup ranking reported that there were 2,096 startups [7].

However, it is very unfortunate that business incubators and digital economy startups are still centered on the islands of Java and Sumatra, while the island of Kalimantan is not very popular, as evidenced by the results of a research survey, the island of Kalimantan only has 24 startups (digital economy) and it is also predicted that they can survive only 10 percent. In the study, it was stated that of the 100 startups that were established, only 20% were able to survive [8]-[11].

There are many opportunities for graduate students from the Faculty of Engineering, especially the Informatics Study Program to build a Startup which helps MSMEs that are currently having difficulty selling products, due to the massive spread of COVID-19. In addition, campuses are required to design and carry out an innovative and creative learning process in an optimal, and relevant manner keep up with the times, including the spirit of entrepreneurship through the digital economy and Startup. So that graduates can "Link and Match" with the needs of society, needs of the industrial and the world of work and flexible to follow future changes [12].

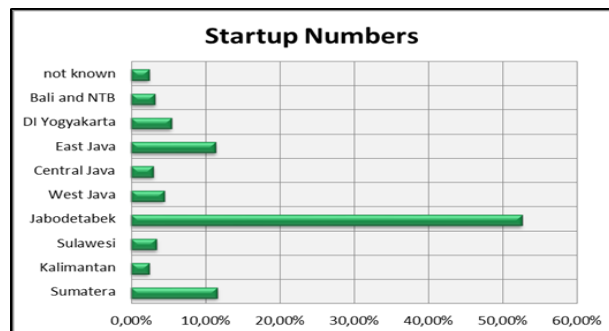


Fig. 1. Percentage of Startup in Indonesia.

There are several problems with SMEs that will be helped. There is an overproduction of chicken, fish and seafood products. Meanwhile, market demand decreased because many economic sectors such as restaurants, hotels, catering and other businesses were not operating. People reduce activities outside the home because of the lockdown. Floods are also the problems in Samarinda. 95% of people shop for groceries at grocery stores (Figure 2). This is an opportunity for college graduates to open an online shopping business.

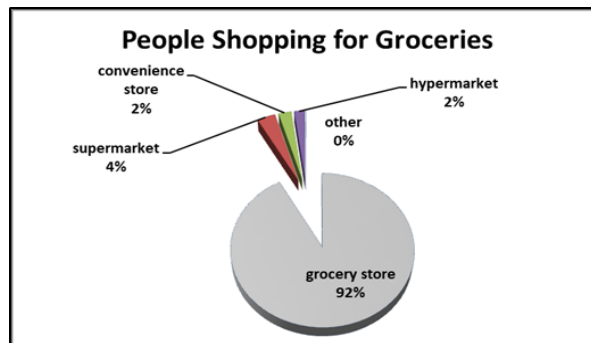


Fig. 2. People Shopping for Their Groceries

II. RESEARCH METHODOLOGY

Campus policy encourages the development of student entrepreneurial interest with learning activity programs that are in accordance with the requirements, regulated in the academic guidelines issued by College. The objectives of the entrepreneurial activity program include: provide students who have an entrepreneurial interest to develop early and guided efforts and addressing the unemployment problem that generates intellectual unemployment from among scholars. They contribute to job creation and economic development at both regional and national levels. A startup is a company working to solve a problem where the solution is not obvious and success is not guaranteed. All Startups have the features such as; innovation, age, growth, risk, flexibility, problem solving, scalability, and work team. There are 6 different types of Startups: lifestyle Startups, small business Startups, scalable Startups, buyable Startups, and large company Startups [13].

A. A Knowledge management model

Higher education can connect talent, technology, capital, and knowledge to foster an entrepreneurial spirit, accelerate company development technology-based, and accelerate the commercialization of technology. Figure 3 is a plot strategy of starting an online business, a knowledge management model that is able to encourage strategy development in digital business [14]. A knowledge management model that is able to encourage strategy development in digital business. Innovation and creativity are needed for creating creative ideas in startup business and the digital economy. Startup business methods are followed by technological trend innovation.

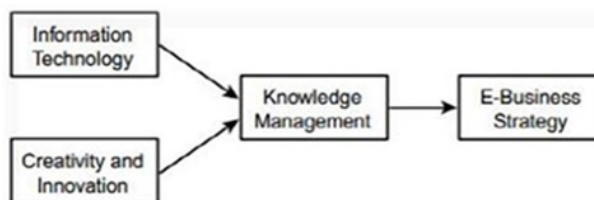


Fig. 3. Knowledge Mangement Model.

As reported by Business Insider [15]. PitchBook processes data to compile universities that produce Startup founders and receive funding from investors. The list was compiled based on data collected from 2006 to June 2018 (Table I).

TABLE I. UNIVERSITIES THAT PRODUCE STARTUP

No.	Universities	Entrepreneur	Startup	Given Capital (dollar)
1.	Stanford University	1.178	1.015	28,84 miliar
2.	University of California, Berkeley	1.137	1.012	20,78 miliar
3.	Massachusetts Institute of Technology (MIT)	941	819	21,24 miliar
4.	Harvard University	900	799	25,35 miliar
5.	University of Pennsylvania	838	757	15,82 miliar
6.	Cornell University	750	693	20,10 miliar
7.	University of Michigan	712	638	12,07 miliar
8.	Tel Aviv University	640	531	7,91 miliar
9.	University of Texas	636	582	7,70 miliar
10.	University of Illinois	526	484	9,94 miliar

B. Research Respondents

The research respondents were 162 informatics students. The method used is distributing questionnaires through Google forms and assessing the products presented, demonstrated and produced by students in the Informatics study program, Faculty of Engineering at Mulawarman University. Data collection methods in the study used questioners and interviews. Students' final assignments are selected which can become startups to be trained and receive coaching and funding assistance.

What batch of students?
162 responses

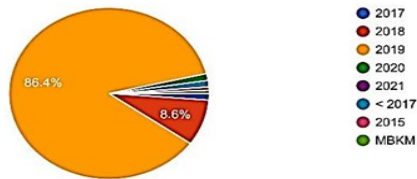


Fig. 4. Total of research respondents

Respondent's gender
161 responses

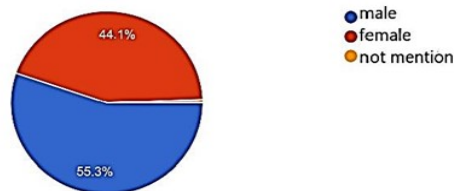


Fig. 5. The gender of research respondents

When is the right time to launch your startup?
161 responses

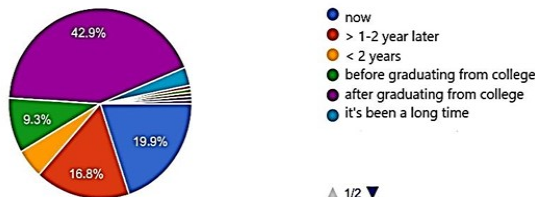


Fig. 6. When they started building startup

C. Influence factors for success startup

A Startup business must be able to take advantage of existing knowledge. Studies identified 21 critical factors for a startup's success grouped into three categories

(organizational, individual and external) and 4 stages the development that the startup will go through (seed, start, growth and expansion).

Is your product able to compete with competitors in the market today?
162 responses

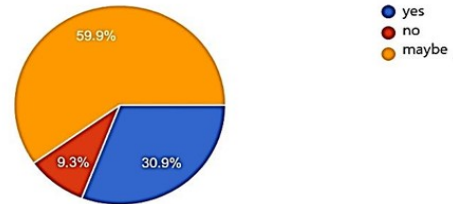


Fig. 7. Respondent Product

Other research findings suggested that curriculum design can motivate ability critical thinking in students and can generate creative business ideas. Activities like Brain storming and mind mapping can be used to stimulate students' potential ideas to be entrepreneurial. The success of digital entrepreneurs influenced by several characteristics described as follows:

- 1) Ability to lead.
- 2) Ability to delegate.
- 3) Team expertise.
- 4) Ability to anticipate risks and make decisions.
- 5) Professional in finance.
- 6) Confident in the business or business.
- 7) Age that should not be too young and have role models or business mentors.
- 8) Having expertise in marketing and communication.
- 9) Able to choose the right colleague or partner.
- 10) Be persistent in developing skills and knowledge related to online business.
- 11) Dynamic and human in various obstacles.
- 12) Having experience and ability in industry, products and markets.
- 13) Often attend digital business training.

Are your products still rare and unique so they can outperform competitors?
160 responses

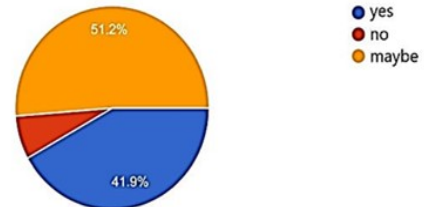


Fig. 8. The respondent's competitive product

Do you already have a partner who has the technical knowledge of setting up a startup?
161 responses

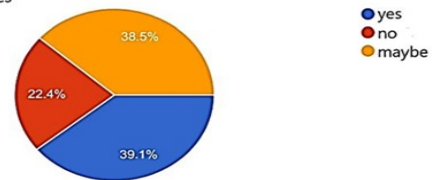


Fig. 9. The respondent's partners

What unique and valuable advantages do you have that your competitors don't have or can't imitate?
159 responses

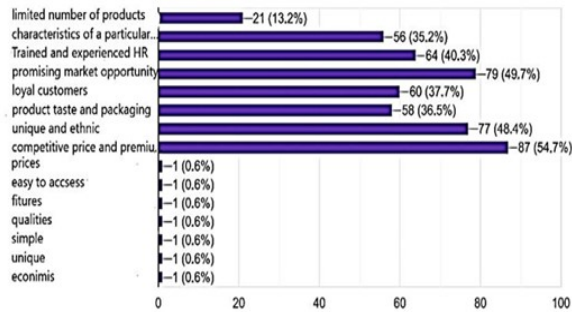


Fig. 10. The valuable advantages competitive product

Do you already have specific information about the market for your product?
161 responses

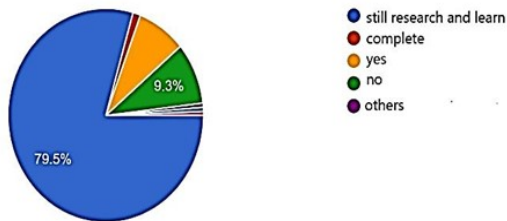


Fig. 11. The respondent's knowledge

The incubator provides a minimum of 7 activities:

- 1) Space.
- 2) Shared office facilities.
- 3) Services containing marketing, finance, production, technology and others.
- 4) Support in the use of technology and business research and development.
- 5) Skills development; training, formulation of business plans, HR management and others.
- 6) Business capital and how to get capital access to financial institutions.
- 7) Synergy in creating adequate local and international business networks.

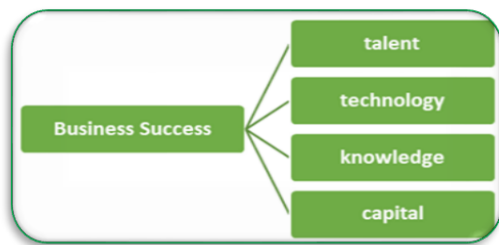


Fig. 12. Supporting Factors for Business Success.

The success of digital entrepreneurs are influenced by several Knowledge described as follows:

1. Marketing management.
2. Financial management.
3. HR management.
4. Operational management.
5. Distribution channels.
6. Academic Experience.

7. Business capabilities.
8. Business plans.
9. Social skills of the entrepreneur.

Technologies are Technological resources, Technological/business capabilities, Product Innovation, Science and technology policy. Capitals are Initial capital, Government support, and Venture capital [21].

III. RESEARCH RESULT AND DISCUSSION

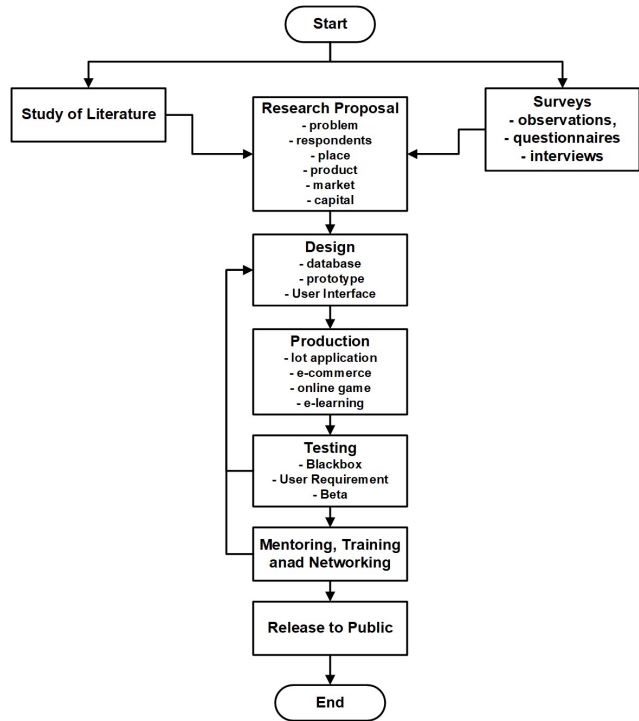


Fig. 13. Research and Startup Stages

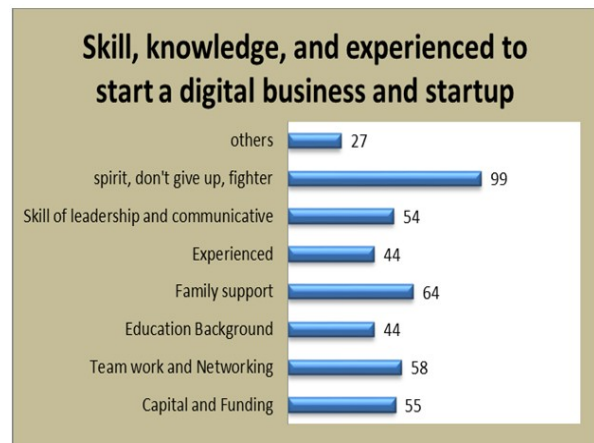


Fig. 14. Respondents skill, knowledge and experienced.

The survey found that one of the ways SMEs survive the implementation of the keep the distance is by changing the types of products they sell. 52 percent of SMEs switched to selling frozen food (33.1%) and various types of cakes (17.1%) to adapt to a pandemic. The research results also reveal that online SMEs currently rely on logistics services arriving on the same day, same day delivery. The advantages

of online shopping include minimizing costs, practicality, efficiency, focus, competitive prices, and convenience factors. In conclusion, there are 5 SME problem clusters when the sales /demand decreases, raw materials are difficult, distribution/operations are hampered, capital and production are hampered.



Fig. 15. Digital Startup Application.

The university's business incubator is a program specifically designed to help students startups innovate and grow. These resources allow startups and innovation ideas to take shape while operating at a lower cost, during the early incubation stages of a business. This is a Startup learning media for student in Figure 15. invention and decision making. The university incubator requires an application process to join and usually requires a commitment for a certain period of time (Table II).

Faculties provide work space, tutoring, education, and access to investors for students starting entrepreneurs [18-19]. University technology commercialization process has 4 stages [20; 22-23]. The stages are called invention, evaluation, confirmed

A. Online game Flora and Fauna in East Kalimantan

This online game has the theme of flora and fauna in East Kalimantan. This game aims to introduce the unique flora and fauna in East Kalimantan, Indonesia, such as black orchids, ironwood trees, proboscis monkeys, mahakam dolphins and hornbills, as well as how to protect their nature (Figure 1) <https://greet-triangle.itch.io/kalimantan-wildlife>.



Fig. 16. Game Online Flora and Fauna in East Kalimantan.

TABLE II. THE RELATIONSHIPS OF INDEPENDENT, MODERATING AND DEPENDENT VARIABLES

Phase	Activity	Factor
Business idea, plan and business team (project proposal)	Selection of proposals, looking for partners / research partners, surveying the location of research, collecting data, and designing applications according to user needs.	Academic entrepreneurship, Academic Experience, student characteristics, student knowledge, innovation and creative product, academic curriculum, training, postgraduate activities in firms; graduate trainees; and supervisors.
Product design making (Pre-commercialization)	Discovery of invention (new technology/ knowledge) and opportunity assessment of the invention. Training in university/faculty business incubator.	Organizational vision and interest, inventor's interest and motivation, opportunity recognition ability, opportunity scanning and industrial trend information/knowledge, marketing strategy, HR development, and financial management.
Funding (Commercialization)	Technology development, identification of application areas, IP assessment and patent application, prototyping, market research, prototype testing, business model analysis, supply chain analysis, funding and production evaluation.	Mode of commercialization (competitive, cooperative and backdoor mechanisms), organization culture and policies, technology transfer office, human and social endowments and patent portfolios.
Network and product development (Post-commercialization)	Establishment of Startup, licensing or selling of the technology, funding sourcing, marketing and production activities and economic added value.	Knowledge spill-over, faculty, university, government and industry. Formation of social relationships and networks at conferences

A. Chicken Products and Behambinan

The design stage is making a use case diagram which functions as a website design framework, to determine which users can do anything in the application. It is important to design application according to the needs of respondents, before the system is built. In this application, an admin can add, save, delete, update and display existing product data in the database to be displayed on the website. The admin can send and receive messages from consumers (Figure 17). He can manage the transaction status, so he has the right to cancel consumer purchases. The last process he also can manage product delivery when the consumer has made a transaction. The second process consumers can view, add and delete shopping lists that are on the shopping cart page. The third process consumers can send and receive messages from the admin. The final process the consumer can complete the product purchase and payment. It can be seen in Figure 17 and Figure 18. The process that can be done by consumers; being able to display and search for the desired product (Figure 19).

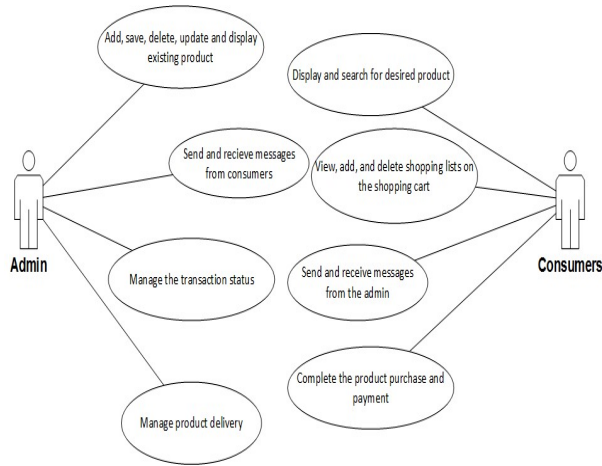


Fig. 17. The Usecase Diagram of e-commerce

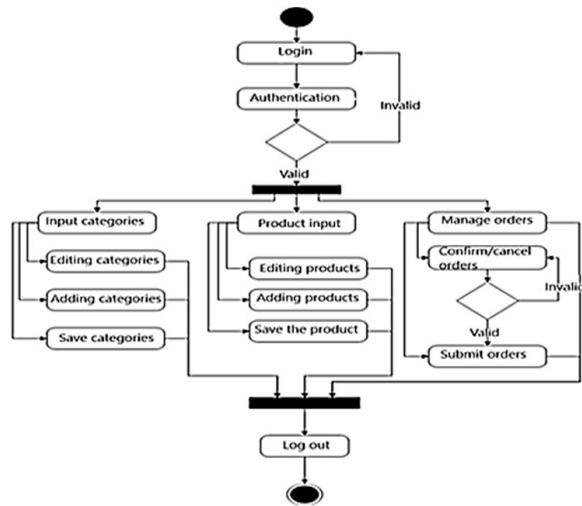


Fig. 18. Input Product Menu

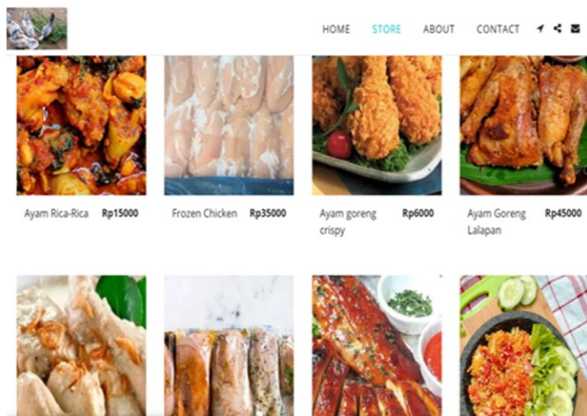


Fig. 19. Order Food Online

Behambinan is a marketplace application, taken from the local language (hambin), which means to carry or support each other, shopping for iftar and sahur dishes and orders for meetings at local government offices. This application is an effort to turn on the wheels of the community's economy amid the Covid-19 pandemic, specifically considering the improvement of MSMEs in the city of Samarinda during a pandemic. Accounts registered in the Behambinan

application 3.940. Successful Transaction 951. Registered shop/seller 817. Starting transactions: If there is an Order Enter your shop, there will be a notification on your smartphone, to receive an order, open the order. If the product ordered is available, accept the order by pressing accept order, if the product is not available you can reject the order. Pay attention to the delivery date. Orders that you have received can be seen on the transaction history menu. After the order is received, you just have to wait for the eCourier to pick up the order at your shop (Figure 20).

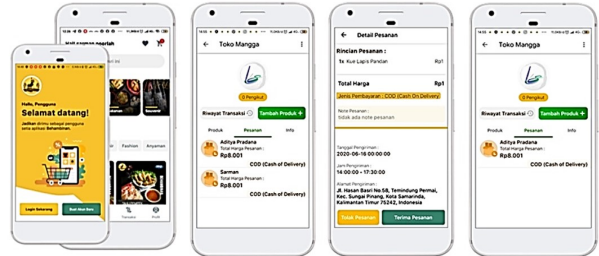


Fig. 20. Behambinan Application.

B. Internet of things (IoT) flood early warning system and (temperature and humidity) control system for broiler chicken coops

Several startup examples from students assignments include; EdTech, Digital Media, Smart City, Hospitality & Tourism Tech, Life Sciences, Healthcare, Medical Simulation, Cyber, Robotics, Energy and IoT [24] and [25]. This is the example of Internet of Things on Figure 21 and Figure 22.

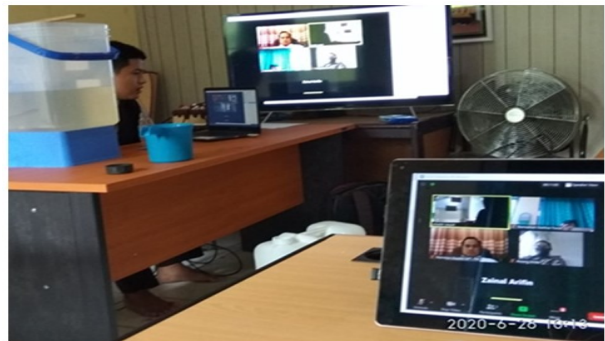


Fig. 21. Flood Early Warning System.

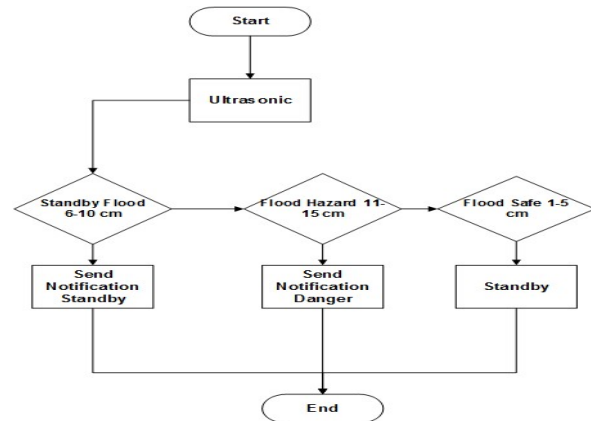


Fig. 22. The flowchart for the Flood Early Warning System.

In conditions where the temperature increases, the DHT11 sensor will detect the temperature and the humidity that will be displayed on the LCD 16x2, and instruct the water pump to turn on and splash water in the form of water dew through a relay that is set based on the source code on the Arduino ATmega328, this system is also equipped with Buzzer output that is useful as a sign or warning will change to a higher temperature.

IV. CONCLUSIONS

Research technology-based companies (startups and digital economy) are important in a competitive economy. Universities are expected to play an active role in producing graduates who are aware of becoming entrepreneurs, creating jobs, and building a strong people's economy. The university is responsible for fostering MSMEs so that they can adapt and increase their income by using information technology and control systems. The game received 46 downloads from March 1, 2021 to May 24, 2021. Based on the results of the study, it was concluded that more than 80% of testers felt they could introduce flora and fauna on the island of Borneo. Build shopping applications, online-based public services, and controllable delivery of goods for various products, so that they can reach consumers quickly, easily and safely. The IoT for flood early warning systems, detection of temperature, weather and humidity and other IoT is expected to be simplified, mass produced and implemented for the benefit of the wider community. Meanwhile, according to research respondents, to establish a Startup, the following criteria are needed; spirit, don't give up, fighter (71.7%), Family support (47.1%), Team work and Networking (42%), Capital and Funding (39.9%), Skill of leadership and communicative (39, 1%), Education Background (31.9%), Experienced (31.9%) and others (19.6%).

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