Development of the "SINEMA STARTUP" application for an ecosystem of startup idea creators using the SDLC and Lean Startup methods

Sularso Budilaksono[1)*], Febrianty[2)], Fahrul Nurzaman[3)], Ahmad Rosadi[4)], Muhammad Anno Suwarno[5)], Woro Harkandi Kencana[6)], I Gede Agus Suwartane[7)]
[1] Information System, University of Persada Indonesia YAI, Indonesia
[3,4,5, 7] Engineering Faculty, the University of Persada Indonesia YAI, Indonesia
[2] Accounting Faculty, Institute of Technology and Business PalComTech, Indonesia
[6]Communication Faculty, the University of Persada Indonesia YAI, Indonesia
[1]sularso@upi-yai,ac,id; [2]febrianty@palcomtech.ac.id, [3]fahrul.nurzaman@upi-yai.ac.id ,
[4]ahmad.rosadi@upi-yai.ac.id, [5]suwarno@upi-yai.ac.id, [6]woro.harkandi@upi-yai.ac.id

Abstract: Indonesia is a country with a dense population and among them are young people who have the potential to open new jobs. Many university graduates cannot be absorbed by the industry and they have to develop new businesses. The Central Statistics Agency (BPS) reported that the number of unemployed for the August 2020 period increased by 2.67 million people. The number of startups is growing and growing in Indonesia, but the main problems for startups are in the capital, human resources, customers, laws and regulations, and market segments. This research aims to develop the "Sinema Startup" application which aims to create and develop new startups in the right ecosystem. The research methodology uses a combination of SDLC (System Development Life Cycle) and Lean Startup methods with an Object Oriented approach. Respondents are potential startup creators, mentors, developers, testers, incubators, and investors. 1. Based on the results of User Acceptance Testing for the "Sinema Startup" Application, it was found that 93% of creators had no difficulty using the application and the remaining 7% had little difficulty. For mentors, 97% had no difficulty using the application and the remaining 3% had little difficulty. The limitations of this study are that not all stages of seeding, incubation, stocking, and publication can be carried out and the results monitored. The uniqueness of this research involves many users for testing, namely prospective startup creators, mentors, developers, testers, incubators, investors, students, and students. Testing this application requires a testing process that goes along with the growth of the Sinema Startup application.

Keywords: startup, seedling, incubation, deployment, spreading, mix and match, usability, testing

INTRODUCTION

The problem of unemployment is a very important issue in employment in Indonesia. The Central Statistics Agency (BPS) reported that the number of unemployed for the August 2020 period had increased by 2.67 million people. Thus, the number of unemployed workers in Indonesia is 9.77 million people. The Covid-19 pandemic caused the open unemployment rate (TPT) in Indonesia to increase from 5.23 percent to 7.07 percent. Similarly, reported by Tempo.com "Thousands of new graduates graduate from various universities every year and they are ready to enter the world of work,

*name of corresponding author

but getting a job is not easy, especially when the economic situation in Indonesia is uncertain due to the impact of the Covid-19 Pandemic".

Various ways have been pursued by the government through the world of education, including the development of education that is characterized by link and match and the development of competency-based education. These methods show that the education carried out must be under the needs of the world of work so that the absorption of graduates by the world of work is high. Therefore, education must pay attention to the competencies that exist in the world of work to be developed in learning, so that students have competencies as expected of the world of work.

In this digital era, Indonesia has the potential to become a Global Startup Ecosystem as stated in the SWA media "a report entitled Global Startup Ecosystem Report 2019 (GSER) released by Startup Genome in May 2019, Jakarta is a strong challenger (challenger) as a city with a potential startup ecosystem. on the global stage or The Next Top 30 Global Startup. Jakarta is on par with big cities such as Seoul, Moscow, and Tokyo". But the fact is that in the development and implementation of many startups, they have failed. According to data from Bekraf's data report entitled Mapping and the Indonesian Startup Database for 2018, the main problems faced in a startup or start-up business include (1) Capital (38.82%), (2) HR (29.41%), (3) Facilities (15%), (4) Regulations and Laws (8.82%), and Market (7.94%).

In connection with the above, the formulation of the problem in this research is how to develop an ecosystem so that startup idea creators can realize these ideas so that they grow and develop. The purpose of this research is to build a startup application that is expected to become an ecosystem to give birth to other startups. This ecosystem is expected to be a medium for gathering all startup stakeholders such as creators, mentors, developers, testers, incubators, investors, and students.In the introduction, researchers are expected to be able to explain the existing phenomena or background information such as prior work, hypotheses,problems to be discussed. This is followed by a statement of the purpose of the research issue or problem and/or set of questions you attempt to answer in your research.

LITERATURE REVIEW

The business model may have been well known and recognizable to startup developers, but this idea didn't become publicly acknowledged and examined until the 1990s.(Zott et al., 2011). The internet itself, which saw such rapid expansion, was one of the most significant factors in the advancement of traditional business prior. (Ripsas et al., 2018). The business model itself must be able to depict how an organization might function and can explain a partnership with technology developers that could result in economic benefit. (Casadesus-Masanell & Ricart, 2010). In Indonesia, there are many digital firms that are expanding quickly but lack a solid business plan to ensure sustainability. (Kainde, 2019).

The startup can be understood as a business that has recently been founded and seeks to develop a suitable business strategy to endure in an unpredictable environment. (Jaya et al., 2017). In the age of the digital revolution, startups are a type of entrepreneurial innovation. (Göcke & Weninger, 2021). The digital, social, and economic revolution have created a new market reality that has given rise to new, specialized organizational structures. (Skala, 2019). According to Mardi Arya Jaya's research, having a strong team and human resources, the correct timing, as well as sufficient ideas and finance, are what make a business successful. In addition to these elements, the lack of a structured understanding of their industry, the failure to discover customers, and the failure to validate their assumptions at an early stage are the main causes of startup failure.(Trimi & Berbegal-Mirabent, 2012) whereas, by utilizing creativity and the appropriate instruments, these failures can be avoided. (Baloutsos et al., 2020).

The business model is nothing but a reflection of the company's strategy more objectively (Tohanean & Weiss, 2019). The business model itself can provide value to the customer for a development that is an advantage for the company (Faria et al., 2021), This value relates to the internal features of the business to identify the market and is a general description of the goods or services produced by the company. (Robb et al., 2020), A corporation's self-assessment in the eyes of other organizations and clients includes resources, processes required by the company to develop value, and arrangements for offering consumers and partners value to the company. (Trimi & Berbegal-Mirabent, 2012). However, the instrument is of little significance in real life as many factors rooted in different areas of expertise play a role (Bätz & Siegfried, 2022).

*name of corresponding author

Lean Startup takes its name from the lean manufacturing revolution of the Toyota Production System (TPS). The production and supply chain systems are drastically altered by lean thinking. (Kumar et al., 2023). The ability of employees to simplify batches, production time, inventories, and speed up cycle time can be stated in this context. (Ries, 2011). Lean startup adapts this concept in the context of entrepreneurship (Pauley, 2021). Lean startup teaches the difference between activities that provide added value and waste and shows how to create a quality product (Lizarelli et al., 2021). The lean startup model is designed to minimize the risk of returns from products made for market needs (Ardyanti et al., 2019). According to research by Nagy in Lean, businesses exploring IoT as a way to enhance their product or service offerings can quickly test their hypotheses by creating an MVP and leveraging it to create new revenue streams and provide value to customers. (Nagy et al., 2018).

This study focuses on using startups to benefit recent grads. An important and quickly expanding area of expertise for university-based accelerators, incubators, and technology transfer offices is accelerating the launch and expansion of innovative technology businesses. Stayton's research indicates that educational technology entrepreneurs are capable of creating ground-breaking technologies, setting up businesses, becoming global, and expanding internationally. (Stayton, 2016). To collaborate on the creation of actual software products, Robb developed a paradigm of multidisciplinary cooperation between students in entrepreneurship and computer science engineering schools. encompassing The principles of Lean startups and agile software development work together to support practical projects. (Robb et al., 2020).

The difficulties that may be encountered later must be taken into consideration when creating a startup. According to Giardino's research, a behavioral framework used in product development can be used to show how inconsistencies between managerial strategy and execution can lead to failure.(Giardino et al., 2014). Descriptive statistics from Cantamessa's research show that a lack of a structured Business Development strategy emerges as the main determinant of startup failure in the majority of cases (Cantamessa et al., 2018). There is a chance that the software and education industries will diverge, necessitating practical knowledge for researchers, teachers, and practitioners. (Cico, 2021). Identified three highly interconnected domains of research activity that characterize the multidimensional features of entrepreneurship in academic settings (Rogers, 2014), as well as substantial gaps in the literature on research evaluation techniques to aid in the marketing of prospective scientific discoveries (Mansoori & Lackeus, 2020). There are four stages consisting of the initial idea; recognition of how this idea unlocks value for customers and other stakeholders (Hampel et al., 2020); development of innovative business models; and a commercialization strategy that has a real impact (Guindalini et al., 2021).

METHOD

The research method used is a combination of the SDLC (System Development Life Cycle) method and the Lean Startup method. The SDLC method consists of analysis, design, implementation, and testing stages (Olorunshola & Ogwueleka, 2022). The implementation phase uses the Lean Startup method which consists of the stages of building (Build), measuring (Measuring), and studying (Learning). In a business, Lean Startup is a method that minimizes the risk of startup development time and costs. The Lean Startup provides a framework within which to test key assumptions about a project while building toward a sustainable business model (Townend, 2021). This is done by relying on iterations from the product to the consumer market to get quality feedback as soon as possible and as often as possible from the market (Euchner & Blank, 2021). Another important thing in the Lean Startup method is Validated Learning which can be defined as the process of finding out relevant facts related to the design of a startup.
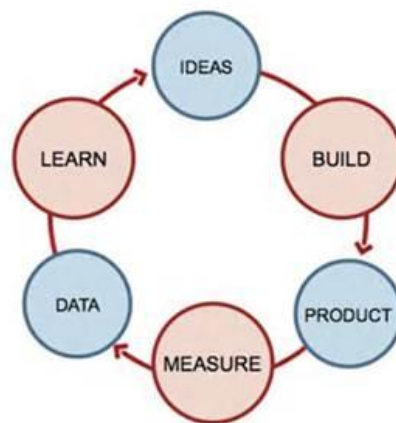
Fig 1. A cycle of the Lean Startup method

RESULT

The Sinema Startup application as a large ecosystem allows its users to interact. The role of the user forms an ecosystem that is expected to grow and develop. Users in this application include:

1. Sinema Startup Management (SS): manage all resources in the SS application through the SS dashboard
2. Idea creator (new startup): users who will develop new startups or already have startups but have not yet developed them
3. Mentors: users who evaluate startup ideas inputted by creators.
4. Developers: users who offer minimal application development cooperation (Minimum Viable Product)
5. Tester: user/customer who tests the MVP.
6. Incubator: a user who offers new startup incubation services
7. Investors: users who offer funding assistance to startup creators
8. Students or the general public: users who purchase materials related to content development, marketing, and creation of digital startup content.

DISCUSSIONS

The Lean Startup Method is a popular approach in startup development developed by Eric Ries. This method prioritizes testing quickly and efficiently with the aim of reducing risks and costs in product or service development. Several stages of testing in the Lean Startup method include:

1. Identify problems and solutions: The first step in testing the Lean Startup method is to identify problems and solutions faced by the market or potential customers.
2. Making a hypothesis: Next, make a hypothesis about the problem to be solved and the solutions offered.
3. Hypothesis validation: The next step is to test the hypothesis that has been made by conducting a simple experiment. The goal is to ensure that the solutions offered can actually address existing problems and meet market needs.
4. Gather feedback: After conducting experiments, collect feedback from customers and the market. This feedback is very important to improve the product or service so that it fits the needs of the market.
5. Product improvement: After gathering feedback from customers, use this information to improve the product or service. Based on this feedback, the startup team can determine whether to continue product development or decide to stop.

After making improvements, the test cycle must be repeated again to ensure that the product or service produced is in accordance with market requirements and can actually overcome existing problems.

In the Lean Startup method, it is important to test hypotheses quickly and efficiently so that the startup team can get useful feedback in a short time. In this way, the team can minimize risks and costs in product or service development so as to accelerate startup growth and success.

Some of the important roles of the Lean Startup method in startup development are as follows:

1. Reduce the risk of failure: By testing product hypotheses and involving customers in the development process, startups can minimize the risk of failure and gain useful feedback to improve the product.
2. Increase efficiency: Using the Lean Startup approach, startup developers can save costs and time in product development. They only focus resources on the essential features customers need and avoid unnecessary spending.
3. Increase competitiveness: The Lean Startup method allows startup developers to respond more quickly to market changes and customer needs. By continuously testing and improving their products, startups can maintain their edge in the market.
4. Increasing investor opportunities: Investors are more likely to invest in startups using the Lean Startup method, as these startups show a tendency to minimize risks and increase efficiency in product development.

Overall, the use of the Lean Startup method can help startup developers to speed up product development, reduce the risk of failure, increase competitiveness, and increase investor opportunities.

The initial step for the development of a Startup Sinema application is to formulate the application requirements. Application requirements determine the capacity of the features that will be executed by the user. This application is a startup that brings together several users, namely: startup idea creators, mentors, developers, testers, incubators, investors, and students or the general public. Each user has a different role and function. The functional requirements of this application are to bring together startup Idea Creators and their partners (mentors) who will bring startup ideas into stage 1 (ideation), stage 2 (incubation), and stage 3 (dissemination). This application accommodates novice entrepreneurs in the digital field from the planning stage to the action plan so that startup creators can produce higher-quality startup products and be able to compete in the digital market. The method used is:

1. Seeding: find startup creators and ideas (ideas from creators) which will then be reviewed for opportunities or business potential.
2. Incubation: incubation (a process of coaching, mentoring, and development provided by the Incubator) starts from application development to launching and meeting potential users.
3. Widespread: disseminate or publish nationally the startup until its use can develop.
4. Mix and match: bringing startups together with investors/angel investors, all of the above is done through the "Sinema Startup" application platform.

These users are expected to be able to interact through the Sinema Startup application with the functions and roles of each user. The startup idea creator has a central role in this application because all other users have to relate to the creator relatively. The stages of business process in the Sinema Startup application consist of 3 stages. The first stage is ideation which aims to attract as many startup idea creators as possible to submit their ideas. The mentor provides an assessment of the startup idea and the output of the idea stage is a refined startup idea. This first stage is also called the idea seeding stage. The second stage is the build and measure stage. At this stage, developers are expected to offer services to creators to build an MVP (minimum viable product) for creators. This stage is also called the incubation stage with the output being the MVP product which is ready to be tested by the tester. The third stage is the stage where testers, incubators, and investors test and check the feasibility of the MVP to get incubation and investment from incubators and investors. At this stage, the system will carry out many publication processes and mix and match so that creators can obtain cooperation with incubators and investors.
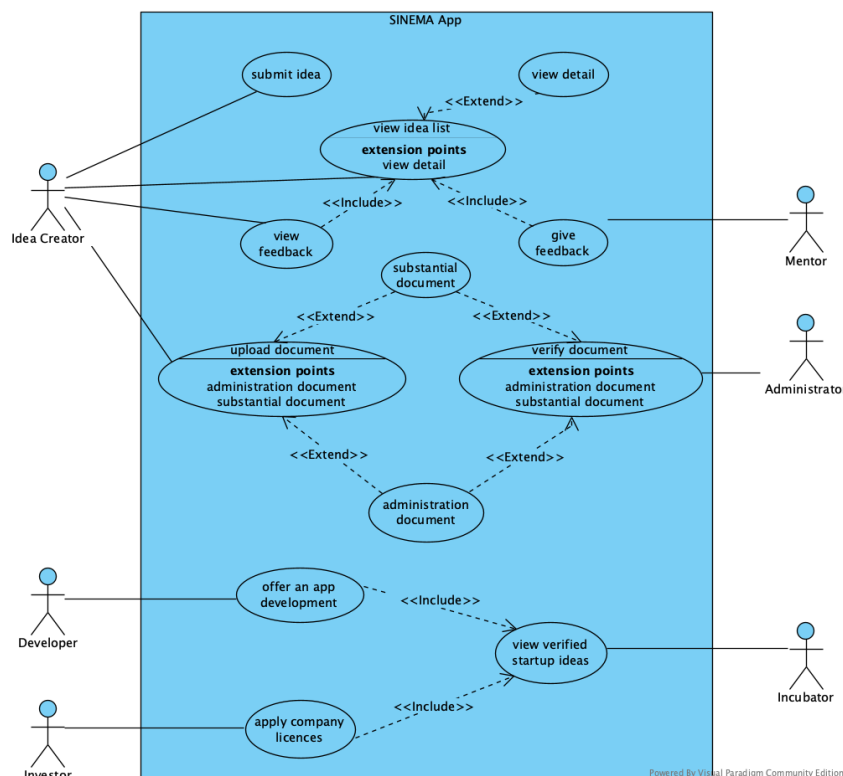
*name of corresponding author

Fig 2. Diagram Use Case for Sinema Startup application.

`   Creators must enter startup ideas into the Sinema Startup app. This information includes the title, description, type whether it is an idea or an application, customer segments, what services are offered, channels, and other information as contained in the Business Model Canvas. After inputting this information along with supporting files, the information on startup ideas it will be read by many mentors. Mentors will apply for permission from creators to be able to review and assess startup ideas. After this submission is received by the creator, the mentor can review and assess a status idea. If the value of this startup meets the criteria, namely the value is above 75, then this startup idea will be accessible to developers. Developers then propose to work together to be able to develop the startup idea into an MVP (minimum viable product). After the MVP is formed, this MVP will be accessible to testers. They can apply for permission from the creator to test the MVP. The results of the MVP testing by the testers, the creators must make improvements to the MVP. MVPs that have been refined will be accessible and reviewed by incubators and investors so that they can propose collaboration with creators to carry out the incubation or investment process.

The interactions of all users using the Sinema Startup application are shown in a sequence diagram. At the beginning of this application activity, the creator must create an account, then log in and submit the desired startup idea. Information on initial startup ideas must also be accompanied by information related to the Business Model Canvas explanation of the idea. All mentors can see information about startup ideas, then mentors submit offers to creators. The creator then considers the offer and then approves the mentor's offer. Mentors can then evaluate startup ideas from creators. Only ideas that have a value above 75 will be processed in this application. Startup ideas that score less than 75 are expected to be corrected or the creators submit new ideas. Startup ideas that have a value above 75 can then be accessed by developers. The developer then studies the startup idea and if interested, the developer can submit an offer to develop the application, even if it's just an MVP. The Minimum Viable Product that has been developed by the developer is then tested by an independent tester who is actually a candidate from the startup idea user. MVP that has been tested by the tester and if it requires improvement, there will be an iterative process between improving the MVP and testing by the tester. If it is felt that the MVP is approaching the feasibility of releasing it to the general public, then the incubator and investors can carry out their duties and functions. Incubators and investors first examine the opportunities and potential to assess the prospects for these startups. Students or the general public

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can browse modules or books related to startups, which are sold by mentors or creators who have successfully developed startups and write them in e-book form. All of these activity flows are described in the sequence diagram as follows:
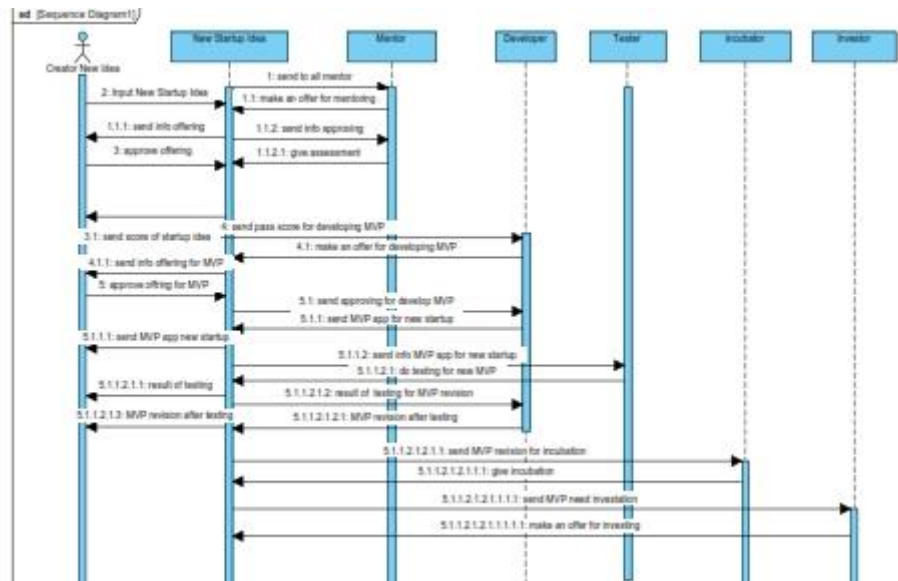

Fig 3. Sequence Diagram for Sinema Startup application.

The class diagram of this application consists of several classes. Among them are creator classes, startup ideas, mentors, developers, testers, incubators, investors, students, BMC, and MVP classes. The startup idea class has sub-classes, namely the BMC and MVP classes. Below is an image of the Sinema Startup application class diagram. This class diagram also interacts between its classes as well as users interact. Interaction between class diagrams is done by calling the method of each class which is public. Derived classes can access the attributes and methods of their parent class which are set with visibility as protected. This diagram class also represents the tables from the database to support this application.
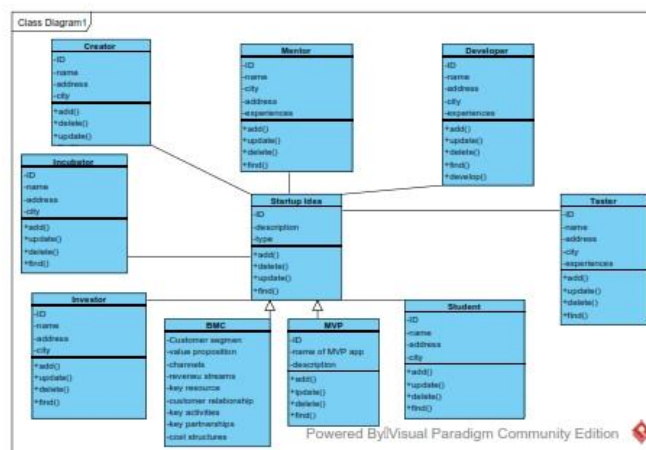

Fig 4. Class Diagram in Sinema Startup application.

The main key users of the Startup Sinema application are startup idea creators who are expected to be the most users of this application. The ease with which startup idea creators convey startup ideas is one of the advantages of this application. The next user is a mentor who will evaluate startup ideas and provide input for improving startup ideas so that startup ideas can be perfected. Another user that is no less important is the developer who will help turn a startup idea into a Minimum Viable Product (MVP) so that this MVP is easy for testers to test. This tester is a representation of actual users who will later

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become customers of the MVP startup. Criticism, suggestions and input from testers is the process of improving the MVP so that it can cover deficiencies and has more potential to be used by a wider range of customers.

Fig 5. A user interface for Creators in the Sinema Startup application.

Testing of the Sinema Startup application was carried out on creator users and mentors. Testing for other users cannot be done yet because this is still a long process in line with the development and growth of the Sinema Startup application. In the early stages, this application was tested on 30 creators and 5 mentors. Input from creators and mentors is needed for the improvement of this application. Testing was carried out on 30 startup creators and 5 mentors were asked to test the application. The result is that 93% of startup creators had no trouble using the app and the rest had some difficulty. For tests conducted on mentors, the result is 97% of mentors have no difficulty using the application, and only 3% experience problems. For other users, user acceptance testing has not been carried out.

The lean startup method is a business development approach that focuses on speed, experimentation, and fast iteration. This method is especially suitable for startup development in Indonesia, where a constantly changing business environment requires a flexible and innovative approach. Here are some steps in applying the lean startup method in startup development:

1. Create a strong business hypothesis: in the early stages, it is important to create a strong business hypothesis which will be tested through experiments. The business hypothesis should focus on the problem to be solved and the proposed solution.
2. Conduct market research: the next step is to conduct market research to collect data on potential customers, competitors, and market trends. This market research will help startups to validate business hypotheses and understand customer needs and preferences.
3. Build MVP (Minimum Viable Product): Startups can build MVP (Minimum Viable Product) as a way to test business hypotheses and get feedback from customers. This MVP can be a product or service prototype that is simple and easy to test.
4. Measuring MVP performance: Once an MVP is built, startups can measure the performance of that product or service through measuring relevant metrics, such as number of users, conversions, and retention. This can help startups improve their product or service and strengthen the business hypothesis.
5. Gather feedback from customers: Startups should continuously collect feedback from customers to understand their needs and improve their products or services. This can be done through surveys, interviews or product trials.
6. Implement rapid iterations: After getting feedback from customers, startups should implement rapid changes or iterations to improve their product or service. Startups can take an agile approach to develop their product or service more quickly and effectively.
7. Gradually develop the business: Once the product or service has proven to be successful, startups can begin to gradually develop their business. Startups must constantly monitor market trends and customer needs to ensure that they remain relevant and competitive.

*name of corresponding author

CONCLUSION

1. Based on the results of User Acceptance Testing for the "Sinema Startup" Application, it was found that 93% of creators had no difficulty using the application and the remaining 7% had little difficulty. For mentors, 97% had no difficulty using the application and the remaining 3% had little difficulty

2. The limitation of this research is that not all stages of seeding, incubation, spreading, and mixing-matching approaches can be carried out, and monitor the results.

3. The uniqueness of this research involves many users for testing, namely prospective startup creators, mentors, developers, testers, incubators, investors, and students.

4. The lean startup method can help Sinema Startup Applications so that the MVP application development process is successfully completed within a developent time span of only 2-3 months.

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*name of corresponding author