Conference Paper

Lean Startup Approach for Developing Information System of Research and Community Service (SIRIP)

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Abstract

Development of this Information System of Research and Community Service (SIRIP) program is expected to grow outside Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia. SIRIP is a solution system for all universities in order to support their "*Tridharma Perguruan Tinggi*" at point B and C, which are each lecturer are obliged to conduct research and community services each year. Research Institution and Community Service of Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia has been applied, which creates maximum result and helps Institution of Research and Community Service officer to conduct data entry and monitoring of community service activities. Using Lean Startup Approach, it is expected that this SIRIP can be a startup pioneer on SIMLITABMAS field of study by Institute Internal version. So that university will no longer have difficulties to report to the central about their proposed research data and community service that has been conducted by the internal campus.

Keywords: Community service, information system, lean startup

INTRODUCTION

The university's assignment is to facilitate and accommodate all activities of "*Tridharma Perguruan Tinggi*" which is held both by lecturer and students. Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia is a university which has an institution that accommodates two of three "*Tridharma Perguruan Tinggi*" activities. It is Institution of Research and Community Service. The activities that are hosted by Institution of Research and Community Service are research and community service.

Some activities of "*Tridharma Perguruan Tinggi*" are educational and teaching activities, research, and community service. Every academic member within university's scope is obliged to conduct "*Tridharma Perguruan Tinggi*". Academic member referred to are Lecturer and Student. Each lecturer are obliged to conduct "*Tridharma Perguruan Tinggi*" by doing their obligation as Lecturers. Each student are obliged to conduct "*Tridharma Perguruan Tinggi*" by doing their obligation as Student through their education.

Institution of Research and Community Service is an institution which holds the mandate to accommodate research activity and community service within Universitas Pembangunan Nasional "Veteran" Jawa Timur. In order to hold the mandate well, the research and community service within the collage environment are accommodated by a system which arrange a groove and display information report which is wanted by its user.

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One of activities management standard to be achieved is Process Standard, which is all activities must be planned, conducted, controlled and improved according to a sustainable research system quality improvement.

Basically Information Research System and Community Service is used so it can facilitate its user, which are Lecturer, Students, Research Reviewer and other parties. Other process that can be conducted are monitoring and reporting implemented activities. This system is expected to become media for all academic member in doing their research and community service.

This systems information is already exist and applied in Institution of Research and Community Service Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia, so the process of *"Tridharma Perguruan Tinggi"* and students community service will be done easier and documented well. The problem faced by the university or other college is similar, that is why Information Research Systems and Community Service (SIRIP) fit perfectly to assist the specific chronology problem especially at private collage. Marketing and developing SIRIP require certain pattern to develop its computer science and marketing management aspects to several institutions. In order to be able selling and developing this SIRIP application writer tries to lift it up as start-up business. The problem need to be avoided is start-up tend to have difficulties to gain user after creating a products that have been made. Because they do not conduct customer development study to raise market acceptance before produce the product. Then failure happens because there is no user using the product or want to pay for them, eventually company will spend a large number of money and a long time for nothing. A product can be called a success if it is needed by user and able to solve their problems. In startup world there is a term *"get out of the building"*, popularized by Steve Blank (2012) which means an entrepreneur can't build a product isolated from their market. By using Lean Startup approach it is expected to ease development and marketing this SIRIP application.

Concept of Lean Startup is risk minimalize methods in building business, especially by relying on iteration (repetition steps) from product to market to gain good quality feedback as soon as possible and frequently form the market. Key principle of Lean Startup is to reduce waste. Lean Startup process reduces waste by increasing contact frequency with customer, so that testing can be done and incorrect market assumption can be avoided early. Using this Lean Startup concept it is expected that SIRIP can grow and help more institution outside Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia.

METHODS

Information System

Information is data that is processed into more valuable and meaning for its recipients, while data is source of information which describe a scene (group of facts). Information system, according to Leitel and Davis on their book "Accounting Information System" define it as "Information System is a system within an organization which unites daily transaction management needs, backs up operational, spatially managerial, and strategic activities of an organization and provides necessary reports or other outer parties".

In common definition, information system is a system within an organization which process data into more useful form to achieve a purpose (Jogiyanto, 2005).

This system is consists of several element such as process and output, as seen as Figure 1. According to Jogiyanto (2005) in his book named Analysis and Design of Information System, it is explained that: "System is a network of interrelated procedures, gather together to conduct an activity to fulfill a certain goal."
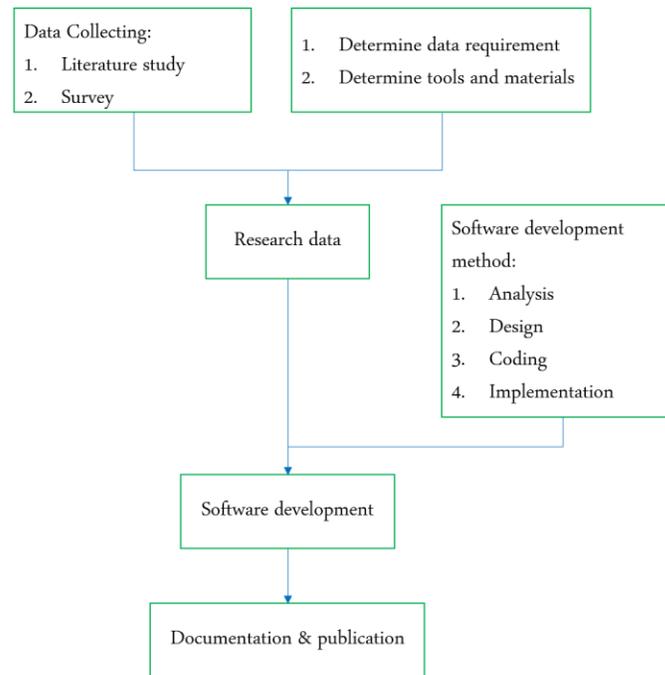
Figure 1. Research Design

Lean Startup

Ries (2011) defines Startup as "a startup is a human institution designed to deliver a new product or service under conditions of extreme uncertainty. startups are designed for the situations that cannot be modeled, are not clear-cut, and where the risk is not necessarily large - it's just not yet know."

According to Steve Blank (2012), academics and entrepreneur on Silicon Valley defines Startup as "an organization formed to search for a repeatable and scalable business model."

According to Paul Graham (2012), founder of one of the best startup accelerator in the world, defines Startup as "A startup is a company designed to grow fast. Being newly founded does not in itself make a company a startup. Nor is it necessary for a startup to work on technology, or take venture funding, or have some sort of exit. The only essential thing is growth. Everything else we associate with startups follows from growth."

From definitions above it can be concluded that Startup is a new company that is designed to grow fast. Lean Startup will teach differences between activities that give added value or "junk", and shows how to create a product. Surely Lean Startup takes more on science and entrepreneurship context than manufacturing system. Lean startup use progress control unit known as validated learning. Customer feedback is used to move every iterations possible to evolve quicker than traditional way.
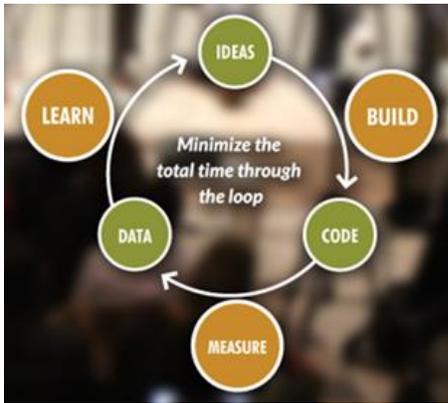
Figure 2. The lean startup process

From Figure 2 above, it can be explained that Lean Startup is started with an idea that can be developed into community solution form, then developing that form with information technology approach in form of information system.

Within that creating information system process there are several codes must be written and concluded to conduct measure process to evaluate the solution of that information system. When a system is ready to use, then back up data can be inserted to completing and testing the system. Last step is to test and market out the system using Learn approach, which will produce a feedback from user outside the location where it is produced.

Customer Development

Steve Blank was the first to introduce Customer Development concept in a book called The Four Steps to the Epiphany. Customer Development is questioning your core business assumption. Customer Development is a four step framework to find and validate that you have identified market for your product, build a right feature product to solve customer need, test the right method to achieve and converse customer, and using the right resource to enlarge business scale.
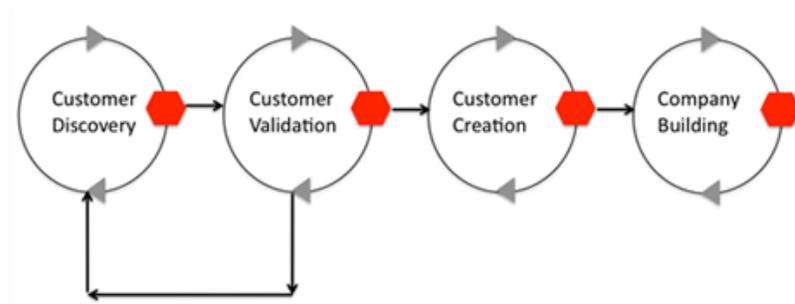

Figure 3. Customer Development Model

There are 4 steps mapping problems, hypothesis to solve problems, and how startup use test of the problem solving. Most of the test are done manually with a few or even no touch of any information technology.

1. Describing phenomenon or problems which startup faced on the market.

    For example. A university has several potential lecturer to conduct research within internal community, but there are obstacles in managing entry data from all departments or study programme.

2. Formulating causal hypothesis to explain problem statement.

   Human resources at institution which hold research is still less or less effective work while correcting data from writer.

3. Explaining hypothesis to help solving problems and predicting its implemented result with new approach.

   Mapping all fields available at the university is necessary in order to coding on file collecting.

4. Measuring predicted performance based on experimental test.

   Opening new registration using the same model and scheme but different on file collecting process using labeling on each available documents. Startup then can change hypothesis and start over again.

Through this repeating process (iterative), slowly your new company can start to define what technology feature can be built to solve problems. From the explanation above it is obvious that there is not any kind of technology used in problem solving process. Startup can use any available tools (such as Facebook/Twitter) to test its concept and gain feedback/market validation soon. Besides, it is very important or startup to gain feedback from market or real customer who is actually paying the startup to solve their problems. In above example, we will ask startup to collect hypothesis as mentioned above to know how many customer appreciate your services. This hypothesis is a base for business model, if this kind of model approach have not reach maximum result, then it can be linked by making a supporting information system or existing problems. Customer Development is not a once done process, startup team must be involved continuously as long as it lived. Because they fix their understanding about customer, their problem, motivation and budget, etc.

RESULT AND DISCUSSION
Data Flow Diagram SIRIP

Using this SIRIP structural approach it will make a design analysis with Data Flow Diagram (DFD) in several level, such as:
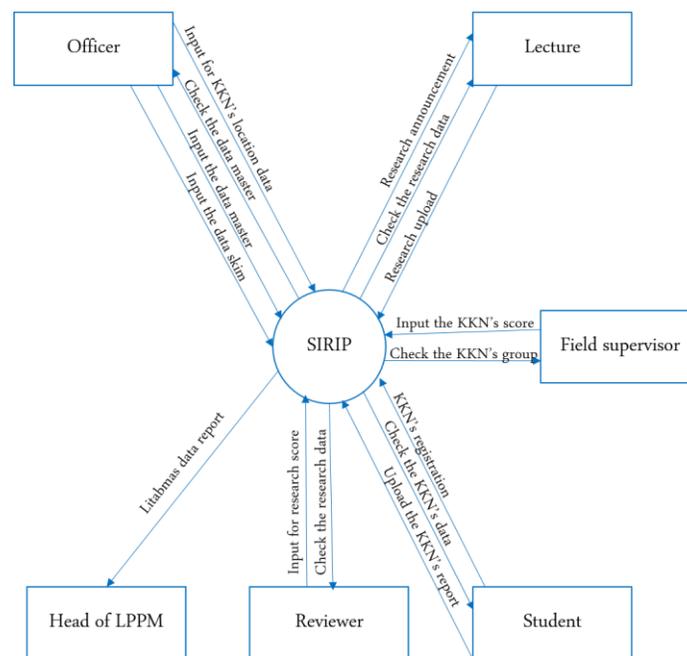

Figure 4. SIRIP Context Diagram

On diagram context Figure 4 above, it explained that there are 6 users involved on this system, they are:

a. **Officer**

The task of this Officer user is as administrator of this information system, where all master data are processed and officer registration can have full access. This officer can conduct distribution of student community service and plotting research reviewers' names and community service to assess lecturer proposal which have entered SIRIP.

b. **Lecturer**

As this Lecturer user, it can conduct research and community service proposal, and also see update information linked to Research and Community Service. When a lecturer have entered their independent research proposal, then after login this lecturer can also see whether their proposal status is accepted or not.

c. **Student**

As this Student user, it can conduct registration and enter proposal for student community service, also apply their student community service activities proposal. After performing student community service registration, the student can see their groups data, location and supervisor, so that he/she is no longer need to come to the secretary of Institution of Research and Community Service Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia to ask about the matter.

d. **Supervisor Lecturer (DPL)**

As DPL User, it can perform to seek information linked to student community service, DPL is a lecturer who is plotted by Institution of Research and Community Service officer to conduct their task as DPL on student community service location as specified.

e. **Reviewer**

As Reviewer User, it can do assessment on research proposal and community service. This Reviewer is a lecturer who has been plotted by Institution of Research and Community Service officer and approved by its superior.

f. **Head of Institution of Research and Community Service**

As Head of Institution of Research and Community Service User, it can only see all report that has been conduct by the ongoing system. So that this Head of Institution of Research and Community Service can see this report up to date.

SIRIP Business Model Canvas

Business Model Canvas is popularized by Osterwalder and Pigneur (2011) based on their book named Business Model Generation. On Business Model Canvas, there are nine which described main elements of each business.

Those nine elements are:

a. **Problem & Existing Alternative Startup**

It must identify three main problems which will be solved. Startup also has to acknowledge what kind of effort other people do to solve similar problems.

b. **Customer Segment & Early Adopter Startup**

This model writes on who are market target of the business initiated at. From that determined market target which ones are considered early adopter.

c. **Value Proposition**

This model must be able to writes on what makes them different from others (differentiation). What makes them stand out and what first problems will be solved and for whom that solution is for.

d. **Solution**

This model consists at least three features of the product based on problems that want to be solved.

e. **Customer Relationship**

This model contains of what substance belongs to this startup but no other startup has.

f. **Revenue Stream**

This model contains of how this startup works to earn money and grows.

g. **Cost Structure**

This model must know how much expenditure that is going to happen, not in five years, but in each month.

h. **Key Resource**

This model contains of activities on your measureable startup's performance.

i. **Channel**

Product marketing channel of the startup, such as through SEO, Blogs, Website, Facebook Ads, printed ads, events, words of mouth, partnerships and friends.

Table 1. Canvas Business Model of SIRIP

Problems	Solution	Value Proposition	Customer Relationship	Customer Segments
- ridharma …	- arketing on social media	SIRIP basically use for lecture, student, reviewer, etc. SIRIP also use for research activity monitoring.	- elf-registration	
- ecture	- esearch data		- p to date information	
- taff	- nstitution research		- eriodic report	
- PPM	- eb based information system			
- aperless	**Key Resources**		**Channel**	
	- eb based		- ocial media	
	- Information system		- oogle Ads	
			- EO	
			- niversity website	
Cost Structure		**Revenue Streams**		
- KI/Patent		- ollaboration model with other institution		
- ds		- onitoring system support		
- ystem maintenance		- eveloping and evaluation		
- nformation dissemination for each institution				

CONCLUSION

Lean Startup can help all process needed to develop SIRIP outside Institution of Universitas Pembangunan Nasional "Veteran" Surabaya, East Java, Indonesia. Using this canvas business, in the future SIRIP will have broader view for development model on information system or touch of technology on information. So that the university using this SIRIP will always gain newest information and update on bug which is in this Information System.

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